













# MEMOIRS:

COMPRISING THE

NAVIGATION TO AND, FROM CHINA,

BY THE

*China Sea,*

AND

THROUGH THE VARIOUS STRAITS AND CHANNELS

IN THE

*INDIAN ARCHIPELAGO;*

ALSO,

THE NAVIGATION OF BOMBAY HARBOUR.

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1805.



TO

*ALEXANDER DALRYMPLE, ESQ. F.R.S.*

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SIR,

THESE Memoirs, explanatory of the Navigation of the China Sea, Malacca Strait, and Bombay Harbour, with diffidence I inscribe to you, and regret that they are not more worthy of your patronage.

It is not merely on account of having enjoyed your friendship, for many years past, that I take this liberty; but from a consideration, that a life which has been devoted to unremitted labour, for the improvement of navigation and the benefit of mankind, entitles you to a tribute of this nature.

With respect and great esteem,

I am,

Your obliged and most obedient Servant,

J. HORSBURGH.

sion of the visible horizon, occasioned by the difference of terrestrial refraction, from the effect of land and sea breezes, unequal degrees of heat, or density in the atmosphere near the surface of the earth and sea.

This fluctuation of the horizon near land is, however, not always experienced ; at such times the altitudes or latitudes taken on the visible horizon of the sea will be exact. But in making correct observations on shore, the visible horizon of a lake or the sea should never be used ; for the errors arising from the mutability of the visible horizon are avoided by using an artificial one, of water or quicksilver, in a bason, placed in a situation where there is no wind : these fluids are most proper for an artificial horizon. Oil, tar, &c. from the ebullition produced by the sun's rays, present unequal surfaces, and have been found to differ from water and quicksilver ; these always corresponding with each other.

It is also proper to observe, that the manuscript charts of the China Sea and Malacca Strait, being constructed from *transient remarks* and observations, made in navigating along by the common routes, are consequently in many parts defective ; allowance for which will be made, when it is recollected that *regular surveys* are only approximations towards perfection.

JAMES HORSBURGH.

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MEMOIR OF A CHART,

EXPLANATORY OF THE

*NAVIGATION*

OF

THE CHINA SEA.

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# REMARKS

ON THE



## NAVIGATION OF THE CHINA SEA.

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1. OF THE UNCERTAINTY WHERE MOST OF THE DANGERS ARE SITUATED, AND ERRORS OCCURRING THEREFROM, TO THOSE UNACQUAINTED WITH THE NAVIGATION OF THIS SEA.

**T**HE vessels which navigate on the China Sea belonging to different countries, and even those belonging to the Chinese empire, are probably of greater magnitude, and more valuable, than any other commercial vessels used in other parts of the globe. These have been ever necessitated to blunder through this confined navigation; totally ignorant of the true situation of most of the dangers, and of several of the islands and principal head-lands.

What is here alluded to, particularly relates to the western part of the China Sea. The extensive groups of dangerous shoals, strewed over the south-east part, from the coast of Palawan to the latitude of nearly twelve degrees north, are so numerous, and therefore generally avoided; that the knowledge of them is very scanty or imperfect.

The limits of the group of shoals, delineated on most charts by the name of Paracels, and comprehending a space in latitude from about eleven and a half to seventeen degrees north, are absolutely unknown, although projected to an extent of nearly half the length of the China Sea. By whom their name was given, when, and on what account, like the knowledge of their limits, appears equally uncertain.



It has been said that the Portuguese of Macao were acquainted with the position of these shoals: but at present they are ignorant respecting them; except that they think them more distant from the coast of Cochin China than placed in the charts.

In most charts, the southern limit of the Paracels approaches to eleven and a half or twelve degrees north latitude; and from this limit southward, between it and Pulo Sapata, are placed several islands, viz. Cambridge Islands, Brothers, or Islands and Bank of the Scorpion's Tail; and Pulo Ceicer de Mer to the westward. Neither the Bank of Scorpion's Tail, nor any of these islands exist, except Pulo Ceicer de Mer, which island, together with some of the neighbouring mountains, or Cape Padaran, have been by those, navigating in error, transmuted into the islands, Brothers, &c. From the same cause have the high islands, said to be on the south part of the Paracels, originated. Ships returning from China by the outer passage, set greatly to the westward of account by the current; and seeing the mountains on the continent about Cape Varela, have imagined these to be islands of the Paracels or Brothers, which the following extracts seem to exemplify.

June 9th, 1789, we passed Pulo Sapata, at the distance of five leagues. Having light winds and calms, two days afterwards saw the land to the north-west, making like high islands; these we thought to be the Brothers: their position to us appeared to agree with Mr. Herbert's description, from the French ship Prince de Conté's Journal. A current had set us somewhat to the westward; and Pulo Sapata being placed in the charts more easterly in its relative distance from the coast of Cochin China than it really is, made us confident that the land we saw was islands, and not the continent. But several years after, when a perfect knowledge of the relative position of the coast, Pulo Sapata, Pulo Ceicer de Mer, &c. were acquired, it was then demonstrable, that the land we judged to be the Brothers was the mountains over Cape Padaran.

April 5th, 1788, the ship Lord Walsingham, from China, made the high land about Cape Padaran. This they set for the Brothers, when their distance is said to be only six or seven leagues from it. Afterwards they saw Pulo Ceicer de Mer bearing W. b. S. and then set this island, as the Brothers also. At this time they had south-easterly winds, and passed between Pulo Ceicer de Mer and the Catwicks, judging the former to be the Brothers.

April 4th, 1788, the ship Locko, from China, at 8 A. M. saw Pulo Ceicer de Mer, and set it for the Brothers. By noon observation they made it in latitude about  $10^{\circ} 30'$  north. (N. B. its central latitude is  $10^{\circ} 32' 30''$  north.) At sunset they had Pulo Ceicer de Mer (which they call the Brothers) bearing N. N. W. six

leagues; same time Pulo Sapata, S. b. E. five leagues, and the westernmost, or Great Catwick, S. W. b. S. four leagues, by estimation. They passed to the westward, in the channel, between Pulo Ceicer de Mer and the Catwicks, in soundings fifty to forty fathoms, shoaling to thirty fathoms, as they advanced to the westward.

About 1801, an American ship, commanded by Captain Benners, from China, made Pulo Ceicer de Mer, and was confident of its being the Brothers. He observed the latitude with it bearing nearly west, and made it in  $10^{\circ} 32'$  north, no other land appearing at the time. It was pointed out to him clearly in 1804, at Canton, that it was Pulo Ceicer de Mer, and not the Brothers, he had seen in his former voyage.

Fleurieu's publication of Marchand's Voyage mentions, that, "on Lieutenant Roberts's General Chart of the World, to accompany the narrative of Cook's Third Voyage, the Two Brothers are placed N.  $40^{\circ}$  E. from Pulo Sapata about fifteen leagues." And on Mr. Dalrymple's chart of the China Sea (he says) the Brothers are "placed N.  $17^{\circ}$  W. off the largest Pulo Sapata thirty-three miles."

Captain Marchand, in the Solide, saw the Brothers, and afterwards Pulo Sapata, and by an approximation of the Solide's run from the parallel of the Brothers, to the parallel of Pulo Sapata, Cit. Fleurieu makes the Brothers N.  $21^{\circ} 20'$  W. from Pulo Sapata thirty-five  $\frac{2}{3}$  miles.

What the Solide took for the Brothers, was Pulo Ceicer de Mer; and the distance of its center from Pulo Sapata is about thirty-four or thirty-five miles, and bears about north  $20^{\circ}$  west from it; and from the Great Catwick, nearly north, eight to eight and a half leagues. The two hills on Pulo Ceicer de Mer, at a distance, and the rocky islet off its N. W. end, when near it, are the causes of its being set as islands, or the Brothers.

The American ship Devotion, Sept. 6th, 1803, bound to Canton, "steering N. E. b. E. at 2 A. M. saw Pulo Sapata, bearing S. S. E.; same time Middle Island, south four miles. Hove to head to the westward. At 6 A. M. saw Round Island, called the Great Catwick, bearing N. b. W.; passed through between it and a rock, that is distant from it about four miles on the north side. This passage I found free from danger. At noon, the land on the northern board bearing from north-west to north, which is, I suppose, the islands called the Brothers, and Pulo Ceicer de Mer. Latitude observed at noon  $10^{\circ} 41'$  N."

The only land mentioned above, in which they were not mistaken, was Pulo Sapata. What they call Middle Island, was the Great or Westernmost Catwick. What they call Round Island, or the Great Catwick, was Pulo Ceicer de Mer,

between which and the rocky islet of its north-west end they passed; and the land at noon bearing from north-west to north, which they suppose to be the Brothers, and Pulo Ceicer de Mer, was the high land of the continent, from Cape Padaran to the westward; the gap in the high land to the westward of the cape inducing them to think this land was islands.

How liable strangers are to be deceived, in this part of the China Sea, by islands delineated on the charts which have no existence; and the relative situations of those really existing being incorrectly laid down!

The commander of an American ship, returning from China about 1797, being early in the season, experienced a strong current to the westward, by making the high land on the coast of Cochin China, between Cape Varela and Cape Padaran, and imagined it to be high islands of the Paracels.

The American ship *Lovely Lass*, Captain Galloway, returning from Canton by the outer passage, steering S. W. had run sixty-one miles on that course from the preceding noon. When she saw the land at 6 A. M. October 10th, 1801, bearing from W. b. N. to W. S. W. twelve or fourteen leagues, having made only  $1^{\circ} 56'$  W. meridian distance from Grand Ladrone in a run of five days. From seeing the land at 6 A. M. they steered south three miles, and S. b. E. twelve miles, the land bearing from W. N. W. to S. W. twelve or fourteen leagues; then 10 A. M. after which they did not take any bearings. From 10 A. M. to noon steered S. b. E. eight miles, and observed in latitude  $12^{\circ} 24' N.$

This land, seen by the *Lovely Lass*, which they thought was high islands on the southern part of the Paracel Bank (as they describe them) must have been the high land on the coast of Cochin China; by their run from first seeing the land to noon observation. The land first seen at 6 A. M. was the chain of mountains, of which Cape Varela forms the projection to seaward. The southernmost extreme set at 10 A. M. was the high mountain forming false Cape Varela.

The *Lovely Lass*, having made the high land of Cape Varela on a south-west course, proves that she must have crossed over that part of the China Sea, where the Bank of the Paracels is placed in the charts, between the latitudes  $13^{\circ}$  and  $14^{\circ} N.$  or between  $12^{\circ} 50'$  and  $13^{\circ} 50' N.$  allowing a westerly current to have prevailed at the time. But, at the time they made the coast, they say in the journal (viz. Captain Galloway's) that the current was setting to the eastward: if it had been setting in this direction, on the day they made the land, and that preceding, the *Lovely Lass* must, in this case, have entered on the eastern part of the Paracels Bank, as represented on the charts, to the northward of  $14^{\circ}$  north latitude. The track of the *Lovely Lass*, and other ships, which have been set by a westerly current

over the southern part of the Paracels, according to their situation on the charts, proves that the southern limit of this group of shoals is far to the northward of the generally supposed one, or that there can be only detached dangers to the southward of  $14\frac{1}{2}^{\circ}$  or  $15^{\circ}$  north latitude, with extensive channels between them. Observations made on the swell, in running down to the westward of these shoals, seem to give weight to this opinion.

The tracks of many ships seem to establish the non-existence of the Brothers, or any other islands hereabout, except Pulo Ceicer de Mer, Pulo Sapata, and the Great and Little Catwicks, in the offing; and Pulo Ceicer de Terre near the shore.

Exclusive of the ships already mentioned, who have traversed the space of sea to the northward of Pulo Sapata, many others have sailed on various courses, without perceiving any islands (or dangers) besides those already mentioned.

The ship *Favourite*, of Calcutta, returning from Canton in December 1787, made Pulo Ceicer de Mer, when blowing strong and thick weather: they supposed it was the southern island of the Scorpion's Tail; hauled out to the south-eastward, and soon saw Pulo Sapata, which they passed on the east side.

*Snow Victoria*, from China, December 9th 1789 made Pulo Ceicer de Mer, bearing S. b. W.  $\frac{1}{2}$  W.; passed on the east side of it at three or four leagues distance, and then between it and the Catwicks, in the night.

Ship *Nerbuddah*, returning by the outer passage from Canton, made the high land about Cape Padaran, and shortly afterwards saw Pulo Ceicer de Mer S. S. W.; they passed to the westward of the island, between the islet of its north-west end and Holland's Bank, on the 4th of November 1792.

About 1789, in October, a ship from Bengal stood over to the eastward, about twenty-six leagues from Pulo Sapata, crossing over the position of the Andrada without seeing it. Then tacked with the wind from N. E. and N. N. E. keeping on the starboard tack until in sight of the coast of Cochin China; at which time they tacked to the eastward, and passed over the space assigned to the Paracels, between  $12^{\circ}$  and  $13^{\circ}$  north latitude, reaching Manilla on this tack.

In November 1800, the Ship *Anstruther*, returning from Canton by the Inner Passage, being thick weather, did not see the coast until near Padaran Cape; afterwards she passed to the eastward of Pulo Ceicer de Mer and Sapata, with blowing weather.

Four ships, returning from Canton in company, bound to Malacca Strait, on the 22d of September were abreast of Padaran Bay, when one of them, by making a long tack off shore, could not regain it, the current setting to the south-eastward; she passed to the eastward of Pulo Ceicer de Mer at a great distance, and so far to the

northward of Pulo Sapata, and eastward of that island, that it was not seen from the mast-head. This was in 1803.

The ship *Lord Castlereagh*, of *Bombay*, in December 1804, returning from *Canton* by the Inner Passage, went on the east side of Pulo Ceicer de Mer, at a small distance, and then between it and the *Catwicks*. The tracks of these ships, and many others, favour an inference that the sea is clear of dangers, or islands, for a great space to the northward of Pulo Sapata.

The channel between the Great Catwick and Pulo Ceicer de Mer is wide and safe; that between the Great and Little Catwick appears safe with a favourable breeze in the day, but is seldom used, on account of the reef projecting from the Little Catwick. Many ships however, in cases of exigency, have passed through this channel; and the journals of some others give reason to conclude, that they passed between Pulo Sapata and the Little Catwick in the night, when blowing strong. But by the journals, it cannot positively be learned whether they passed between Pulo Sapata and the Little Catwick, or between the latter and the Great Catwick. Pulo Sapata seems bold to on all sides; but if there is a channel between it and the Little Catwick, it must be narrow, from the reef encompassing this little pyramidal island.

The only account which appears to prove the existence of a reef, to the south-eastward of Pulo Sapata, is that of the Swedish ship *Gottenburg*, in 1744, whose boat is said to have sounded on a reef, having thirteen or fourteen feet water on it when the body of Pulo Sapata bore N. W. b. W. three or four English miles, and deepened to twelve fathoms, standing towards the island. Many people suppose they see this danger in passing Sapata, but differ greatly both in the bearing and distance from the island; some placing it within three miles, and others at three leagues distance from Sapata. Strong rippings, which prevail herabout, occasioned by changes of current, or a kind of tides, may often seem like breakers, and be marked as dangers, which has frequently happened. But many are of opinion that no reef or danger exists near Sapata on the south-east side. However, by forming an opinion from the whole mass or aggregate of recent descriptions relative to this danger, it is possible that it exists, and must be from three miles to three leagues distant from Sapata; for the island is steep to on the south-east side, several ships having passed very close to it on this side, in cases of emergency. In the American ship, *Caledonia*, they say it is about from two to three leagues off Sapata; high breakers on its north end when they passed very near it, blowing strong with a high sea, returning from *Canton* in November 1802. But supposes there is about two fathoms on the shoalest part, and will not be easily perceived in moderate weather.

There is some reason to think the Andrada Rock does not exist, from the various positions assigned, by those who are said to have seen it. In some charts it is placed a little under  $10^{\circ}$  N. latitude, and generally twenty-two to twenty-four leagues eastward from Pulo Sapata. Two Portuguese commanders, belonging to Macao, are said to have seen it; one of them makes the latitude  $10^{\circ} 13'$  N. and the other  $10^{\circ} 17'$  N.

Captain Galloway, in his journal of the American ship *Lovely Lass*, from China, October 12th, 1801, observed the latitude  $9^{\circ} 45'$  N. at noon, and sets the Andrada Rock bearing E. by N. six or seven miles; and four hours afterwards, had three distances of Sun and Moon, which made the rock in longitude  $110^{\circ} 18'$  E. and in latitude  $9^{\circ} 47'$  N. from observation at noon.

So great a discordance in latitude is inconceivable, and induces a belief that neither of them saw a rock; but possibly some large drifts from the Cambodia rivers (which are common) may have been taken for the Andrada Rock.

On the same passage Captain Galloway, in the *Lovely Lass*, October 17, 1801, passed close to a shoal in a squall; the journal describes it as a shoal of white sand, nearly even with the water's edge, about a cable's length in diameter, and their distance not above half a cable's length from it when it was observed, the water being smooth at the time. He makes it in latitude  $6^{\circ} 48'$  N. by account from the noon observation taken three hours before; and exactly on the meridian of the North Natuna, which island he saw twenty-five hours after passing the shoal.

Being so close to this spot, Captain Galloway thinks he could not be deceived; notwithstanding, it may be possible that it was a patch of white coloured fish spawn (called sea saw-dust by Captain Cook) in a limit separating contrary currents.

The Vigio, to the north-east of Pulo Sapata, placed on the charts, is said to have been seen by the ship *Fanny* from Bombay, on the 12th of September 1803. They passed Pulo Sapata at five leagues distance, and two days afterwards saw the Vigio at 5 P. M. 12th September, right ahead. "At 6 P. M. the Vigio, a low and extensive reef, with a tree on its western extreme, a rock towards its eastern extreme, making like a boat's lug-sail, with several rocks between them; the tree then bearing N. b. E. and the eastern extreme of the reef N. E. b. N. distant from us two miles." Latitude of the reef, deduced from noon observation,  $11^{\circ} 17'$  N. and its longitude from Pulo Sapata  $1^{\circ} 13'$  E. measured by chronometer, which makes it bear N.  $44^{\circ}$  E. from Sapata 105 miles.

Notwithstanding this explicit description, it is difficult to affirm how a shoal thus depicted can exist in this situation without being often seen. The track from China,

by the Outer Passage, when ships navigated by dead reckoning, being often right towards it; as also is the track of ships going to Canton late in the season. By chronometer, in a thirty hours run from Pulo Sapata, we have passed in a clear day, within two miles of the position of this danger, as here described, and saw nothing, nor did apprehend any danger near us.

Late in the season bound to Canton, ships generally after passing Pulo Sapata, at a few leagues distance, steer N. E. or N. E.  $\frac{1}{2}$  N. which courses ought to carry them near this Vigio; the latter course, if a ship passes Sapata at several leagues distance, should carry her well to the eastward of it; and the former course, in this case, right towards it, if there is no westerly current. Numbers of ships, returning from Canton, must often pass very near this situation, when navigating by dead reckoning. Several have been upwards of a degree to the eastward of Pulo Sapata, when on its parallel: and the Gunjavar not obtaining sights for chronometers, in returning by the Outer Passage, until to the southward of Pulo Sapata, found, when altitudes were obtained, that they were  $1^{\circ} 40'$  east off Sapata, when on its parallel.

During a period of many years, numbers of ships having crossed over the positions assigned to the Vigio, mentioned above, and that of the Andrada Rock, without seeing either, creates a doubt whether these dangers really exist so near Pulo Sapata as generally supposed. There seems great reason to think, that the nearest danger to the eastward of Pulo Sapata is two degrees distant from that island, or more. However, it is certainly proper to look out for the Vigio, as described by the Fanny; and the Andrada and shoal seen by the Lovely Lass.

Conformable to what has been said at the beginning of this article, of ships blundering through the western part of the China Sea, two recent examples may be noticed. Last season two ships from China, under the convoy of his Majesty's ship Dasher, went by the Inner Passage: they steered too much off shore; made Pulo Sapata and the Catwicks in the night; then blowing strong, were obliged to push through between them. This was dangerous, the weather being dark and unfavourable at the time, and breakers were seen in passing through.

In the same season, 1804-5, the fleet, consisting of nine sail of European ships, under convoy of his Majesty's ship Atheniense, returned from China by the Outer Passage. They saw the Great Catwick at midnight, March 15th, and passed it on the east side, at from two to four miles distance, concluding it to be Pulo Sapata. Several of the ships saw Sapata, and also the Little Catwick; but, from their white appearance by moonlight, judged them to be strange sails. The easternmost ship saw breakers, which must have been on the reef that projects from the Little Catwick, a great way to the westward.

## · II. OF TY-FOONGS \*, OR STORMS IN THE CHINA SEA.

THESE tempests are generally confined to the northern part of the China Sea, between the Island Hai-nam and Formosa: there are also severe storms happen near the north end of Luconia; and to the eastward of this island the Bashees and Fomosa; also from Formosa to the Japan Islands: (the latter are called by the Chinese Yat-poon †, or Country of the Sun, from Yat the sun, and Poon a country, expressive of the sun emerging in the mornings from the ocean adjacent to these islands). Ty-foongs are most severe when near the land. As the distance from the China coast is increased to the southward, a proportional decrease in the strength of them is experienced, their violence seldom extending so far south as 16° N. latitude.

Ty-foongs frequently commence without any previous indication of their approach. A serene sky, with the horizon remarkably clear, is not always a favourable aspect on the coast of China or near it; for often a series of fine weather and calms, favouring the augmentation of heat above the medium temperature, is followed by a Ty-foong, which near the coast generally commence at N. W. or N. N. W. and veer suddenly to north-east and eastward, where they often blow with inconceivable fury, rising the sea in turbulent pyramids, which impinge on each other. From eastward they veer to south-east and southward, then abating in violence. This rotary motion of the wind does not always prevail in Ty-foongs, especially at a considerable distance from the China coast. In such case, after commencing as before at N. W. or N. N. W. they frequently veer to west and south-west, blowing very severe; from thence veering to south and south east, become moderate in that quarter.

These storms have been known to happen in every month of the year, except January, February, March, and April; but, exclusive of these months, a Ty-foong has seldom been experienced severe in May, November, or December. August, September, and October, are the periods most liable to them, particularly near the equinox in September, appears to be the most precarious time, and the more so, if the change or perigee of the moon coincides with the equinox. Four different sea-

\* Ty-foong; great or mighty wind: from Ty, wrote 大 which signifies great, mighty, powerful, supreme; and Foong, wrote 風 signifying wind, in the Chinese language.

† Yat, wrote 日 signifies the sun, or day; and Poon, wrote 國 signifies country or empire, in Chinese: also called Yang.



sons, when this was the case, Ty-foongs happened on the coast of China; and in three different years ships have been dismasted near the coast lately, on the night of the 21st of September.

On the 13th of September 1798, a Ty-foong did considerable damage; and about the 15th September 1802, the Nautilus of Calcutta, and a Spanish frigate, were lost in a storm near the Lema Islands.

The great violence of a Ty-foong does fortunately soon subside: but gales of wind sometimes blow from the east-north-east or north-eastward steady, for several days, in September and October, near the coast of China: these, however, are not frequent. Some years there is no Ty-foong on the south coast of China; at other times, two or three of these storms have been experienced during one year.

In the months of June, July, and sometimes August, near the coast of Cochin China, and between it and the Island Hai-nam\*, from 14° to 19° N. latitude, gales of wind are experienced, which commence from N. N. W. or N. W. out of the gulph of Tonqueen: these gales blow severe, with dark weather and a deluge of rain. From north-west; they commonly veer to west and south-west, and then to the southward, where they abate.

On the west coast of Luconia, or near Cape Bolinao, in September, October, and November, gales are sometimes known. They mostly commence from N. N. W. or N. W. and blow strong, veering to west, and afterwards to south-west or southward, still blowing strong. Heavy falls of rain generally attend these gales, and a cross turbulent sea.

The prognostic of a Ty-foong, described in the Directory, by the clouds having a red appearance, is not a good criterion to judge by: for a hazy atmosphere on the coast of China, preventing land from being seen at great distances, generally prevails in medium or settled weather. And often at the rising or setting of the sun, particularly at sun set, the clouds all round, especially those opposite to the luminary, are tinged with a heavy red by the reflected light, when settled weather. This appearance has often been mistaken as an indication of a Ty-foong.

Neither is an irregular swell a sure warning of a Ty-foong: for frequently a cross swell is prevalent on the coast of China, and near it, in settled pleasant weather. When the summits of the hills, or islands, are completely obscured in deep black clouds, and the horizon below clear in some places, there is then some irregularity

\* Hai, wrote 海 in Chinese, signifies sea; and Nam, wrote 南 is south. Hainam (Sea South).  
or, in South Sea.

in the atmosphere; but generally speaking, Ty-foongs are seldom preceded by any certain sign or indication. The best method to anticipate these storms, is to attend carefully to the marine barometer, for the south coast of China, being situated not far to the southward of the tropic of Cancer: a marine barometer, if well constructed, (which Troughton's are in general) will be liable to a greater fall of the mercury than might be expected in such latitudes, previous to these storms.

In latitude  $18^{\circ}$  N. on the 21st July 1804, proceeding by the Inner Passage to China, in passing from the coast of Cochin China across the gulf of Tonqueen, the mercury fell considerably before the commencement of a gale of wind from the west-north-westward, out of the gulph, preceding and during the storm; in a marine barometer, by Troughton, the mercury fell from 29.65 to 29.05, being a remarkable great fall for this latitude.

Although it has been observed, that August, September, and October, are the months most liable to Ty-foongs on the coast of China, implicit confidence is not due to such observation; for the severest Ty-foongs have happened either in June or July for several years preceding 1805.



### III. DIRECTIONS FROM MACAO ROAD TO BOCCA TIGRIS.

ABOUT the equinox in September, or at a period when a Ty-foong may be apprehended, a ship, by proceeding upwards to Lintin, or further, will have less wind and sea, should one of these storms ensue, than if anchored in Macao Road.

In a Chinese boat, when procurable, or in the ship's cutter or pinnace, an officer may be sent to Macao for the river pilot, while the ship may proceed upwards without anchoring, if the tide or wind is favourable. Abreast of Macao the water is shoal, nearly to the islands on the east side of the channel, but deeper near the islands than it is towards the western shore; and in passing upwards it deepens fast on the eastern side of the channel towards Lantao.

Most of the channels between the islands eastward from Macao are safe to pass through, but in some places are rocks very little above water; and one or two even with the water's edge, which require a good look out. One of these rocks is said to lie at a small distance from the Grand Ladrone, in the channel to the north-eastward of it. There is said to be a bank on which a ship grounded, at the south side

of the Socko-Chow Islands, which are small islands lying off the south part of Lantao, having a channel with five and six fathoms water within them. The true position of the bank, said to lie in the channel to the southward of the Socko-Chow Islands, is not well ascertained. Some ships keep near the islands on the south side of the channel in passing, to avoid the bank, supposing it to be near the Socko-Chow Islands; while others keep close to the latter, judging the bank in the south side of the channel; and other ships keep nearly mid-channel, without discovering any bank. The pilots differ in their description of this supposed bank; some of them asserting it is in mid-channel, others saying there is no bank in this channel. But it appears probable, that there is a small shoal of rocky bottom on which a ship would ground; perhaps near mid-channel, to the southward of the Socko-Chow Islands.

There is a reef of rocks even with the water's edge, situated at a considerable distance from the north-west end of Lantao, on which account this part of the island should not be approached very close in the night.

From Macao to Lankeet the western side of the channel is formed by an extensive mud flat, on the verge of which the depth of water decreases regularly (but quick in some places), rendering the lead a safe guide in the night. From the west end of Lantao (or more southerly) to Lintin, and from thence nearly to Lankeet Flat, the water is much deeper in the eastern part of the channel than it is towards the western shore.

Departing from, or passing Macao Road, steer to the north-eastward towards Lintin: in the night from  $4\frac{1}{2}$  to 5 fathoms is good soundings; for frequently greater depths cannot be obtained at low water spring-tides, until several leagues to the northward of Macao Road, and then well over to the eastward. In turning with a northerly wind and favourable tide, tack from the west side of the channel in  $4\frac{1}{2}$  fathoms or thereabout. The islands on the eastern side may be approached close as far as Lantao. Between Lantao and Lintin, working from  $4\frac{1}{2}$  fathoms on the western shore to 6 or 7 fathoms in the east part of the channel, is a fair space in the night, the shoal soundings on the western side being relied on as the principal guide.

Between Macao and Lintin the tides set irregular; the ebbs being stronger, and generally run longer than the flood tides. During several months of the southerly monsoon, the freshes prevail out of the river; at which times, a strong breeze is requisite to make a ship governable: for frequently, when there is a tide of flood on the surface setting upwards, the freshes continue underneath to run down the river; which counter tides prevent ships from answering their helm in light breezes.

These freshes set to the westward amongst the islands westward of Macao: in September and October they sometimes sweep along the islands from Macao to St. John's, in a direction between W. S. W. and W. N. W. with a velocity of  $1\frac{1}{2}$  or 2 miles an hour. These freshes (or westerly currents) are not constant; but slack at times, and then a kind of weak tide to the eastward appears. Ships falling in with the land to the westward of the Grand Ladrone, in August, September, October, &c. and finding it tedious getting to the eastward on account of the freshes setting to the westward along the islands, should stand off into deep water, ten or twelve leagues or more from the land; there they will be out of the counter currents, and will more easily gain ground, for the westerly current seldom runs strong where the depth exceeds thirty fathoms, except when strong gales from the eastward prevail.

The freshes from the river never set towards the islands eastward of the Grand Ladrone; the water being deep here, continues separated from the fresh water of the river; and although a kind of tide sometimes is experienced, yet a small drain of westerly current is more prevalent, especially in the northerly monsoon, which must impel the freshes in a direction to the westward, along the bank where the water is shoal, near, and amongst the islands to the westward of Macao.

Lintin Peak is in latitude  $22^{\circ} 25'$  N. and four miles to the eastward of the meridian of Grand Ladrone. Proceeding from Macao Road upwards, when near Lintin, the water deepens from twelve to fifteen fathoms on the west side of the island, if within two miles of it; and shoals fast in approaching near the Sandy Bay, where the watering-place is. This is the situation most proper for ships of war, or others, to choose in the north-east monsoon, if they do not wish to proceed so high as Bocca Tigris. From the north and south ends of Lintin, spits of shoal water project to a considerable distance, but are out of the tracks of ships passing on the west side of the island.

The channel is wide abreast of Lintin, and the depth decreases regularly but quick, on the mud bank that lines the western shore; which makes it proper, in working from Lintin towards Lankeet, to heave the lead brisk when standing on the edge of the western bank, that a long or deep ship may be enabled to tack in time sufficient to prevent grounding in the stays.

When abreast of Lintin, day or night, and anxious to proceed higher up the river, the lead is an infallible guide: work from  $4\frac{1}{2}$  or  $4\frac{3}{4}$  fathoms on the west side, to  $6\frac{1}{2}$  or 7 fathoms at most on the eastern part of the channel, when to the northward of Lintin; and in anchoring 6 or  $6\frac{1}{2}$  fathoms is a good depth, if near high water spring tides, the rise and fall being generally about eight feet perpendicular at these times.

In the north-east monsoon the tides are frequently irregular, one running strong and the other weak, each day: and, like those at Bombay and on the coasts of Concan and Guzarat in the same monsoon, the night tide is more high and runs stronger than the day tide. In the weak (or sham) tide there is very little flood, and only a few feet difference in depth between high and low water.

If the wind is fair, run up in soundings from 5 to  $6\frac{1}{2}$  fathoms: with a westerly wind, keep in the west side of the channel; if it is easterly, from 6 to  $6\frac{1}{2}$  fathoms is a good track with the flood tide. The sand which bounds the channel on the east side, commences about a league, or a little more, to the northward of Lintin, extending in a northerly direction nearly to Lankeet Flat. This sand (called Lintin Sand) is in most parts steep to on the western edge, the water being deeper close to it than in any other part of the channel; and  $6\frac{1}{2}$  or 7 fathoms at low water is close to it in many places. Many of the river pilots are very ignorant of the navigation of the river, and frequently ground ships on Lintin Sand and other places, when the direction of the vessels is entrusted entirely to them. But several of them are acquainted with the river, particularly the fishermen, who come on board, as assistants to the pilot, in Bocca Tigris. Some of the people who come on board, as outside pilots amongst the islands, are also very ignorant of the channels leading to the river.

Abreast of Lintin, at two or three miles distance, the course about N. b. W. is proper for some time, but the tides do not run fair through the channel; particularly when well up towards Lankeet, the flood sets to the north-westward and the ebb to the south-eastward in general. The south-west extremity of Lintin Sand bears about N. b. W.  $\frac{1}{2}$  W. or a little more westerly from the west point of Lintin. In the day, proceeding from Lintin towards Lankeet, draw gradually the high westernmost peak of Lantoa (if visible) on with the west end of Lintin, and continue drawing it more easterly, so that Lantoa west peak may be about midway between the west end of Lintin, and the peak of the latter, by the time the distance is augmented to two or three leagues from Lintin. Advancing to the northward, draw the west peak of Lantoa on with Lintin peak, or a little open to the eastward of it; may then with this mark run up channel, until more than half way from Lintin, towards Lankeet. When half way between them, Lantoa west peak may be brought nearly in one with the east end of Lintin, in tacking from the east side of the channel, and may be brought well to the westward of Lintin peak; in standing to the western shore: but, in advancing nearer Lankeet, the west peak of Lantoa must not be brought to the westward of Lintin peak in standing to the westward. When within five miles of Lankeet, the west peak of Lantoa must not be brought.

more westerly than touching the eastern point of Lintin, when in the western side of the channel; to a considerable way open with the same point, when in the eastern part of the channel. But here the channel becomes more contracted, and a decrease in the depth of water, which is nearly from side to side the same, although still there is a fathom or a fathom and a half more, in the eastern side near the edge of the sand, than on the edge of the extensive mud bank which bounds the west side of the channel, and is here very flat. In this part, where the channel is more narrow, and the depth of water less than further to the southward, nearer marks are required than the distant land of Lantao and Lintin. The following are probably the best to guide a ship through this part of the channel, and for crossing the flat situated about three miles southward from Lankeet.

Proceeding up channel towards Lankeet, with the west peak of Lantao a little open to the eastward of Lintin peak, two small hummocks or rocks will appear, which are situated close to the east end of Lankeet. When these hummocks are plain in sight, they will be nearly in the middle of the opening of Bocca Tigris, if the west peak of Lantao is a little open to the eastward of Lintin peak, in from five to six fathoms in the fair channel. Do not bring the easternmost hummock off Lankeet more easterly than the centre of Bocca Tigris opening, or so much westerly as Ty-foo\* (Tiger Island), which is the point of land on the west side of the opening, until nearer Lankeet; then the easternmost hummock may be shut in a considerable way with the east point of Ty-foo, in standing to the east side of the channel; but not quite so much easterly as the centre of Bocca Tigris opening, in standing to the west side of the channel; or rather not more easterly than on with the Whangtongs, when these islands are plainly seen from the deck. These are two small islands situated a little to the westward of the centre of Bocca Tigris; the northernmost has trees and a fort† on it. When the easternmost hummock of Lankeet is in a transit line with the Whangtongs, they are also on with each other, and appear as one island.

Sampan Chow‡ is a small island to the north-eastward of Lankeet, appearing like a boat bottom upwards, from which it is called Sampan Chow (or Boat Islet). When first seen, in proceeding up channel, it will appear shut in a considerable distance

\* Ty-foo, great tiger: from Ty, wrote 大 signifying great; and Foo, wrote 虎 signifying tiger, in Chinese.

† Tong, wrote 城 is fort; Whang, is royal, or yellow, the imperial colour; therefore Whangtong is Royal Fort.

‡ Boat Rock: from Sampan, a boat; and Chew, a rock. 船礁.


with the high land on the east side of Bocca Tigris; the northernmost of which is the highest, and called Anuinghoy (or Woman's Shoe); this is a high round piece of land, sloping quickly downwards to a bluff point at the west end, on which is a fort at the water's edge; between which, and the fort on the northernmost Whangtong, is the narrow pass called Bocca Tigris, by the Portuguese, from the remarkable island Ty-foo (Tiger Island), which forms the north-west side of the passage. The land of Anuinghoy, from the summit to the eastward, presents a contour of declivity, until it is shut in with Chunpee; at this part exhibiting a small gap, from whence the land of Chunpee (appearing as a continuation of Anuinghoy) extends to the eastward, with a small degree of elevation from a horizontal line. On the north-west extremity of Chunpee is a fort, lately built, with a small look-out turret over it; this land forms the boundary of Bocca Tigris, on the south-east side: between it and Anuinghoy, is a bay extending far into the land. When within six or seven miles of Lankeet, in the fair channel, Sampan Chow will be perceived on with the land as denoted by the line A——1.; and when seen, it is the best mark of guidance in the channel, and for crossing Lankeet Flat, elucidated by the following View, and Explanation.

#### EXPLANATION OF THE FOLLOWING VIEW, WITH REMARKS.

A. Station, when five or six miles below Lankeet, or southward from that island.

B. Station, when upon Lankeet Flat, in crossing it.

1. Sampan Chow, when first seen from A, in coming from the southward, it being a little westward from Gap.

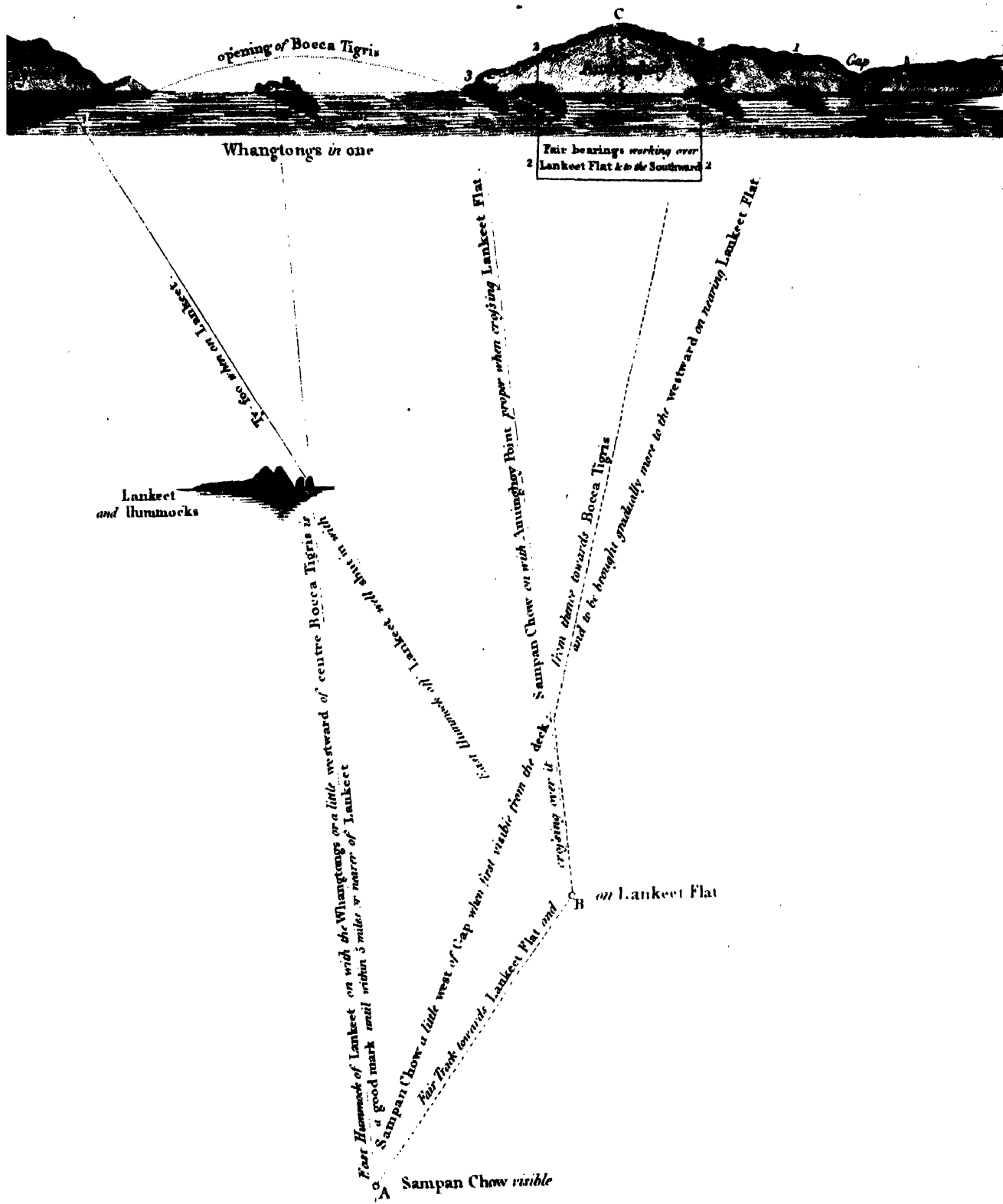
12  2 Sampan Chow within this limit, safe to turn with from station A, and over Lankeet Flat.

3. Sampan Chow on with the point of Anuinghoy, the mark for deepest water on Lankeet Flat.

Proceeding up the river, with the easternmost hummock off Lankeet, nearly in the centre of the opening of Bocca Tigris; or rather more westerly, as represented by the line A D, in one with the Whangtongs; Sampan Chow will be perceived when within six or seven miles of Lankeet; and will be nearly on with the small hollow or gap; or a little to the westward of it, as represented by the line A 1. If so, steer to the north-eastward, and draw gradually Sampan Chow towards the center of Anuinghoy, marked C, with a zigzag line under. In turning, keep Sampan Chow within the limit marked by the figure 2, until within about four miles of Lankeet. Being then near the Flat, it will be proper, in a large ship, to keep

view of Bocca Tigris, when seen from A to the Southward of Lankeet Flat, with Land Marks for crossing the Flat.

This being only a View, the Land & Islands are not in their Ichnographical situations.







Sampan Chow between the zigzag line C and 3, when working over the Flat. If the wind is fair, keep Sampan Chow on with the point of Anuinghoy, as represented by the line B 3; but do not open the island with point 3, until over the Flat, which will soon be perceived, by the depth of water increasing, and the bottom becoming softer. There are generally two or three small detached rows of fishing stakes, close to the northward of Lankeet Flat; and between Lintin and Lankeet, there are fishing stakes in several places, particularly in the western part of the channel; for which a good look-out is requisite in the night, to avoid running over the boats about them, which generally show lights.

In crossing Lankeet Flat, Sampan Chow may be kept on with the point of Anuinghoy, as denoted by the line B 3, until abreast of Lankeet, though not requisite with an easterly wind; for when to the northward of the Flat, if turning, or the wind easterly, Sampan Chow may be opened a considerable way to the westward of Anuinghoy Point. When abreast of Lankeet, are then well to the northward of the Flat, from whence there is soft ground and good anchorage in the channel, to Bocca Tigris; from six or seven fathoms abreast of Sampan Chow, to eight, nine, and ten fathoms in the southern part of Bocca Tigris Bay; and from thirteen to sixteen fathoms, on approaching the Whangtongs.

Lankeet Flat is a bank extending across the channel, nearly in a direction east and west, joining the shoal water which bounds the channel on each side: it is even bottom, and consists of sand in some places; in other parts of sand and mud. The depth of water on it is from 3 to  $3\frac{1}{2}$  fathoms at low water; and from  $4\frac{1}{4}$  to a  $\frac{1}{4}$  less 5 fathoms at high water spring-tides. A ship drawing more than twenty feet, ought not to pass over it until about half flood. The channel, for a considerable distance to the southward of this flat, is rather shoal for a deep and large ship to ride at anchor, when low water spring-tides.

To the westward of Sampan Chow, is an extensive rocky bank, part of them generally above water. When abreast of Lankeet, steer to pass on the east side of Sampan Chow, at any convenient distance, from a quarter of a mile, or less, to one or two miles. When past it, steer direct for the west point, or summit of Anuinghoy, and keep nearest the eastern shore in passing through Bocca Tigris. The western shore is flat and shoal, the depth of water decreasing suddenly on the edge of the bank, which embraces the west side of this beautiful pass: and the circular bay on the east side of the passage (as before mentioned) is occupied by a shoal flat, affording only a harbour for boats. The fair channel through Bocca Tigris, is in a straight direction between Anuinghoy Point and the Whangtongs. There is a rock always

above water, situated at a small distance from the Fort Whangtong, having deep water, seventeen to twenty-two fathoms, or more, close to it ; which rock contracts the channel much, making the passage between it and Anuinghoy Fort too narrow for working in a long ship ; but with the fair tide, a ship can always back and fill through this part, when the wind is contrary.

If there is no pilot on board, the proper place to anchor is abreast, or a little above the southernmost fort on the eastern shore, with the small look-out turret on the hill over it ; the circular deep bay, with low land at the bottom of it, will then be open to the eastward. Here the depth is seven or eight fathoms, and is the best place for ships to lie, particularly those who do not proceed higher up the river. Higher up towards the Whangtong, the water is deeper, consequently not so proper for anchorage, and as ships cannot pass the Whangtong Fort, until the pilot produces his certificate from the mandarin of Macao ; it will be proper (if no pilot is on board) to anchor near the lower fort, as before described. In turning, short tacks are requisite, to keep in the fair channel, lying in a direct line through Bocca Tigris.



#### IV. PLACES AFFORDING SHELTER TO SHIPS, ON THE SOUTH COAST OF CHINA.

**HARLEM BAY**, or Pinghai, the Chinese name, is about one degree of longitude east from Grand Ladrone, and eight or nine leagues to the north-westward of Pedro Branco ; having the Island Mendoza at the entrance. On either side of this island the passage is safe into the bay, where ships may find shelter in threatening or blowing weather. The Island Mendoza breaks the sea from the southward ; the soundings within it are ten, nine, and eight fathoms, near the small islands on the east side of the bay, to five or six fathoms near the village. Mendoza Island is in latitude  $22^{\circ} 30' N.$  and longitude  $114^{\circ} 46' E.$  ; or thirty miles east from the east end of Great Lema\*.

To the north-westward of Meru, or Mizen Island, between it and the island nearest to the westward, is an extensive deep bay ; into which a ship might run in

\* Mer's Bay, in lat.  $22^{\circ} 29' N.$  and bearing about N. b. E. from the east end of Great Lema, appears to be a well sheltered harbour in most winds.

case of a ty-foong, as also into the Typa of Macao ; but the water being too shoal in these places for ships of great draught, it would be improper to resort to them, except in case of necessity ; although it is probable no damage would ensue, by grounding in the mud, it being remarkably soft about Macao, and amongst the islands to the westward. There is five fathoms in the opening between the Mizen and the island westward from it, therefore it may be adjudged safe anchorage.

To the northward of the Island St. John's, within it appears a safe road ; but the water being shoal, a large ship would touch the mud at low water spring-tides ; although, from the peculiar softness of it, no injury ought to be apprehended, should she touch the mud in a storm.

On the west side of St. John's, between it and False (or Little) St John's, the pilots frequently anchor ships, when the wind is easterly, or the weather threatening. This situation appears not so safe in blowing weather, as within St. John's (just described), on account of a reef of rocks above water, situated on the west side of the channel, and near the place where the outside pilots generally anchor ships, when stopping tide, or otherwise.

A ship \*, late in September 1789, made the land about St. John's, got a pilot, who anchored her near the reef of rocks just mentioned : a ty-foong commenced, which laid her on her beam ends ; then driving with all her anchors down, was forced to cut away the mainmast, and cables, and afterwards run her on shore in the mud to the westward of False St. John's. She arrived at Wampoa a month after this accident, and received very little damage, although she run on shore in the strength of the ty-foong, and continued there fourteen days. The same pilot that anchored the Bombay, near the reef of rocks, between Great and Little St. John's in the channel, anchored us in the same situation in April 1787.

A large ship from India, made the coast of China, near St. John's, in August 1803: the wind being strong from the eastward, they got an outside pilot, who anchored them in the channel westward of St. John's, near the reef of rocks. The wind increasing, and a heavy sea setting in from the southward, the ship drove with two anchors ; and, to preclude the danger of driving on the rocks, they cut their cables, and stood out to sea, with the wind at south-eastward, and had some difficulty in keeping off shore until the gale abated.

On the west side of False St. John's, is good anchorage in easterly winds ; but at present the Ladrões (or Pirates) being in possession of these two islands, makes it proper for vessels to be cautious, and not send any boats on shore. The Ladrões

\* The Bombay, Captain Wilson, from Bombay.

are numerous, and have at present a considerable number of junks and boats, committing depredations on a great extent of the coast of China, renders it advisable for ships to be upon their guard, and have some guns ready, to prevent a surprise: particularly two-masted vessels, and small ships. There is said to be a community of Ladrões, who rendezvous among the Paracel group of shoals and islets; from whence they frequently issue, and commit outrages on the coast of China, Hainam, &c.

On the west side of Hai-lin Island, the harbour is safe, and affords supplies for ships, if compelled to visit it, from stress of weather, or otherwise. The west point of the Island Hai-lin, called Twin Point, is seven or eight leagues to the north-westward of the Mandarin's Cap, or in latitude  $21^{\circ} 34' 30''$  N. and longitude  $111^{\circ} 58' 15''$  E. by lunar observations and chronometers. In going into the harbour, the small islets which form the west point of Hai-lin (or Twin Point) must be passed very close, on account of a bank with  $2\frac{1}{2}$  fathoms water on it, bearing N. W. b. N. about four cables length distant from Twin Point: to avoid which, steer past the point at one and a half cable's length from it, on a straight line for the second point, called Rocky Point; taking care not to open the summit of a round mount (named Pilot Mount) to the westward of the point on which the fort is situated. Pilot Mount is the fourth in a line from Peaked Point, so called from a remarkable peaked hill near its extremity, and a small peaked island which is near it. Passing Twin Point in six or seven fathoms water, at a cable's length distant, it deepens to eight and ten fathoms, or more, towards Rocky Point. Pass this point also, at the distance of a cable's length; the  $2\frac{1}{2}$  fathom bank's eastern verge being within  $2\frac{1}{2}$  cable's length of this point. When past Rocky Point, the depth decreases suddenly to five and six fathoms mud, being then past the  $2\frac{1}{2}$  fathom bank, and in the harbour, haul in and anchor at discretion. Under Saddle Island is the best birth, in  $4\frac{1}{2}$  or  $4\frac{3}{4}$  fathoms, good holding ground.

Within Saddle Island is the haven for small coasting vessels, and the town of Olinchy. To the northward is the point which forms the north part of the haven; on it is a fort with eight guns, and a mandarin appointed from Canton, for the protection of the salt traders against the Ladrões. To the westward of the  $2\frac{1}{2}$  fathoms bank, the depth is 4 and  $3\frac{1}{2}$  fathoms near it; shoaling towards the western shore, which is sandy bottom and very shoal, along this part of the harbour. On September 21st, 1804, the Triton, Asia, and Anna, passed Macao, bound for Malacca Strait: they encountered a ty-foong that evening, and were driven greatly to the westward during the night, and got no great distance from the land. The Triton lost the head of her foremast, sprung her mainmast, was obliged to cut away the

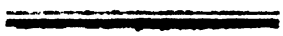
mizen mast, and two anchors. Being near the Island Hai-lin on the following day, when the weather moderated, she entered the harbour in distress, in company with the Asia. The latter sailed from thence two days afterwards ; and the Triton having repaired her damages, and refitted, sailed from Hai-lin harbour, November 11th, 1804. Tien-pe-hien, called Tien-pak by the Chinese of Canton, is a good harbour, in case of ships being driven to the westward of Hai-lin, in distress.

The Hon. E. I. C. ship Warley took shelter in this harbour, after losing her topmasts, &c. in September 1803 ; and on receiving a supply of stores from Canton, worked round to Macao in November. The Queen Indiaman also took shelter in this harbour in 1775 ; a plan of which is among Mr. Dalrymple's valuable collection.

An outside pilot carried the E. I. C. ship Boddam into a cove, at the commencing of a ty-foong, where she lay in security during the storm. This is called Tong-hou Cove, situated on the north-east side of the Island Tong-hou, which island bears about north from the gut that separates the Grand from the Little Ladrone ; distant five or six miles. From the entrance of the cove, the Island Ling-ting bears from E.  $10^{\circ}$  N. to E.  $15^{\circ}$  N. ; Sam-cock, N.  $2^{\circ}$  W. to N.  $8^{\circ}$  W. ; and Lintin Peak N.  $12^{\circ} 30'$  E. This cove is about four hundred yards wide, has twenty-three and twenty-four feet water in the entrance, and seventeen and eighteen feet well inside of it, soft mud. There is a fort on the north-west point of the entrance ; but the south-east point must be passed within half a cable's length in going in. The Boddam had neither proper masts nor rudder when she was carried into this cove, having previously lost them in a ty-foong ; she drew twenty-one feet six inches water at the time : the sides of the cove is high and steep, from the water's edge, with a sandy beach at the bottom of it. There is good water on the east side, obtained from a small run.

The channels between the islands leading towards Canton River, from the southward and eastward, being mostly all safe, render the navigation into it easy in favourable weather ; and what greatly adds to the security of ships in entering this river is, that not a single bank exists about its entrance ; so little similitude has it to most other large rivers on the globe, which are in general so difficult to approach, from the numerous sand-banks which envelop their external limits. Probably Canton River is the safest for navigation of any of the large rivers known, if an inference may be drawn from the number of large ships, which annually resort to the port of Canton, and none of them stranded, so as to occasion the loss of a ship, although the pilots are often ignorant of the navigation of the river. There has not been a ship lost in Canton River during these last twenty years, nor does it appear that any have been lost, except two which were burnt ; one of these by lightning.

The great quantities of mud carried down by the stream in the rainy season, and deposited among the islands about Macao, and to the westward, have no doubt been the cause of the depth here being much less than among the islands eastward from Macao; and probably from the same cause continuing to prevail, the depth may gradually decrease, in the road of Macao, and among the islands to the westward and near them: the waves forced towards the shore by the southerly winds, and the westerly currents prevailing along the coast, must force the mud, brought down by the freshes, towards and among the islands westward from the entrance of the river; but the channels eastward from it, must ever continue nearly as they are, deep and safe.



#### V. OF PASSAGES THROUGH THE CHINA SEA, TOWARDS CANTON.

FROM Malacca Strait, bound to Canton River, it is probably most expeditious, to proceed by the Inner Passage, along the coast of Cochin China, during the months of March, April, and May; but when the month of June approaches, and the southerly monsoon sets regularly in, the track by the Macclesfield Bank will then generally be found the best.

To verify this, the inner passage was chosen in June 1803, and in July 1804. At each time, two ships left the Strait of Sincapour, within thirty hours of us, and proceeded by the Outer Passage, or Macclesfield Bank route.

On comparing the journals of those ships with ours, it was evident, that when nearly in the same parallels of latitude, on the same days, they experienced a steady monsoon; while we on the coast of Cochin China were liable to land breezes in the night, south-easterly and variable sea breezes in the day, with intervening calms, which protracted our passage beyond the time employed by the ships that went the outer track.

A preference of the passage by the Macclesfield Bank, in the south-west monsoon, may be further recommended from the following cause. In the months of June, July, and August, severe gales of wind sometimes happen, on the north part of the coast of Cochin China, and near it; especially between the Island Hai-nam and the 14° of north latitude, with the gulph of Tonqueen open. These gales generally begin at N. N. W. or north-west, and blow with great violence from north-west to west and south-west; from thence veering to southward, where they abate. There

was in June 1803, and in July 1804, each time, one of these gales blowing out of the Tonqueen Gulph, very severe, with dark weather and much rain: and while in the Inner Passage, the danger of being driven among the shoals to the eastward, appeared probable during these storms, those ships in the same latitudes, about  $3^{\circ}$  or  $3\frac{1}{2}^{\circ}$  more easterly, in the outer track, experienced strong and favourable winds from south-west and southward. Thus, when a gale of wind from north-west to west prevailed out of the gulph of Tonqueen at both these periods, the ships to the eastward of the shoals, in the passage by the Macclesfield Bank, had strong south-west and southerly winds.

In the gale which commenced on the 21st of July 1804, from the north-westward of the gulph of Tonqueen, the Portuguese ship St. Antonio, of Macao, from Sai-gon bound to the former port, took a departure from the coast of Cochin China at Pulo Canton, on the morning that we did, previous to the gale. This ship not being able to carry a press of sail to weather the northern limit of the shoals, was driven upon one of them on the 22d of July during the severity of the storm, where she was lost in latitude  $16^{\circ} 45' N$ . When these north-west and westerly gales blow between Hai-nam, and the coast of Cochin-China, a strong south-west or southerly current generally prevails. The commander of the St. Antonio had no observation for three days prior to his shipwreck; and at the time she struck, was by his reckoning far to the northward of the shoals. During the same gale, in two days we experienced a current of fifty miles to the south-south-west. In the gale of 1803, a strong south-westerly current also prevailed.

Although in the strength of the south-west monsoon, the passage to Canton by the Macclesfield Bank, seems preferable to that by the coast of Cochin China: nevertheless, should a ship be weak and crazy, or making much water, the Inner Passage ought certainly to be chosen, as the westerly gales from the gulf of Tonqueen, are not very frequent; and the twofold view of saving both ship and people, seems of magnitude sufficient to induce a crazy ship to keep near the land, when that can be done with prudence and safety. The passage from Pulo Aor to China may with convenience be made, without losing sight of the land, except for a few hours at a time. Leaving Sincapour Strait, or Pulo Aor, steer along the coast to Tringany, or to the Redang Islands; from thence across the mouth of Siam Gulph, to the coast of Cambodia, and along that coast, and the coast of Tsiompa, to Cape Varela; keeping the coast of Cochin China on board to Cape Turon, smooth water will be experienced during the route.

From Cape Turon, it is not above half a day's run to the south-west part of Hai-



nam; this island may be coasted along to Hai-nam Head (being the N. E.<sup>s</sup> promontory), passing between it and the Taya Islands. The run from thence may be accomplished in half a day to the coast of China, about Tien-pe-hein (or Tien-pak), or more easterly about Hai-lin. The islands may be coasted along at discretion, to Canton River; or shelter taken amongst them on emergency. By following this route, a crazy or leaky ship will have smooth water during the passage; and by keeping near the land, may be run into a haven; or on shore, if circumstances require it. But the greatest advantage is, that if the boats are kept clear, and in readiness, they may leave the ship with the crew, on perceiving she cannot be kept afloat: the sea being generally smooth throughout this track, near the land, will enable the boats to reach any convenient harbour, or to proceed along the coast, as deemed most expedient. It is probable, that hospitable treatment would be received, in any part of the Cochin China coast, or at the Island Hai-nam; also on the coast of China: but the Ladrões must be avoided; being outlawed by government, they are treacherous and cruel, to those whom they get in their power.

The passage to China by the Macclesfield Bank, has been in general use for a length of time, by Europeans; and the Chinese vessels trading to Java, Borneo, and Rhio, &c. mostly frequent this passage in their return home, during the south-west monsoon. The Macclesfield Bank appears to be about one degree in extent from north to south; the western edge is thought to be nearly on the meridian of the Grand Ladrone, and its extent on a parallel about seventy miles to the eastward. On some parts of this bank the soundings are very irregular, and there seems to be gaps in a few places; where no bottom is struck, with a hundred fathoms of line. Where the irregularity of depth is, the bank is mostly composed of coral rock. The general depths on the southern and central parts are, from thirty to forty-five fathoms, but there are spots of fourteen to twenty fathoms on various parts of the bank; particularly on the north-east part, and northern limit, there are level spaces of considerable dimensions; on which are regular soundings from nine to fifteen fathoms, gravel or sandy bottom. The Milford, in 1794, on the north-east part of the bank, had regular depths of water from  $8\frac{1}{2}$  to 10 fathoms for near an hour, steering to the north-westward. The least water found on the Macclesfield Bank, by authenticated information, appears to be eight fathoms; which several ships have experienced, on the northern parts of the bank: there probably may be a little less, on some small spots of the coral ridges. Although at present there may be none of them so much elevated, as to endanger the striking of a large ship, yet it seems reasonable to infer, that if, by the vegetating of the

coral, the shoalest parts of this bank become elevated one fathom more than they are at present, and consolidating into rock ; it will then be dangerous for large deep ships to pass over these parts, when the sea runs high.

On the 15th September 1803, the American ship *Devotion* had  $8\frac{1}{4}$  fathoms on the Macclesfield Bank, in latitude  $16^{\circ} 09' N.$  The E. I. C. ship *Cirencester*, Sept. 5th, 1802, had  $\frac{3}{4}$  less 10 fathoms, in latitude by observation  $16^{\circ} 14' N.$  and longitude  $114^{\circ} 34' E.$  or fifty miles east from meridian of Grand Ladrone by lunar observation, agreeing with chronometer. The *Gunjaver*, in latitude  $16^{\circ} 10' N.$  and thirty-two miles east from meridian of Ladrone by chronometer, had ten fathoms, coral rock. Same ship at a different time had in latitude  $15^{\circ} 30' N.$  and twenty-six miles east from Grand Ladrone, by chronometer  $12\frac{1}{2}$  fathoms ; and in latitude by observation  $16^{\circ} 05' N.$  and twenty-eight miles east from Grand Ladrone by chronometers, had ten fathoms coral rock. The *Lord Castlereagh*, in 1803, latitude  $15^{\circ} 58' N.$  and seven miles east from Grand Ladrone by chronometer, had fourteen fathoms coral rock. In latitude  $15^{\circ} 40' N.$  and on the meridian of Grand Ladrone by chonometer, the *Gunjaver* had thirteen and fourteen fathoms. The *Carron*, in August 1802, latitude observed  $15^{\circ} 30' N.$  and thirty-one miles east from Grand Ladrone by chronometers, had thirteen fathoms ; and steering north, continued in various soundings (except for a short time no ground with forty fathoms), until in latitude  $16^{\circ} 04' N.$  and thirty-one miles east by chronometers from Ladrone, the last cast being then forty-four fathoms.

Proceeding up the China Sea, if so late as the middle of October before reaching Pulo Sapata, it appears difficult to assert positively which is the most eligible route to choose. Ships near Sapata, at this period, and so late as the 1st of November, have been favoured by strong southerly winds, which have carried them near the north-west part of Luconia, from whence they got quickly to China: but these instances are not frequent ; for, in general, strong southerly currents prevail about Pulo Sapata, and light winds from the northward, and variable, which prevent ships from gaining ground after the middle of October. These southerly currents are not constant, but slack at times for several days, which may enable a ship, by the assistance of a favourable breeze, to reach the latitude of  $13^{\circ}$  or  $14^{\circ}$  north, where the southerly currents are not so strong as off the projection of Cape Padaran, about Pulo Sapata and the Catwicks: when the latitude of  $12^{\circ}$  or  $13^{\circ} N.$  is obtained, ships will be able to cross over to the northward of the shoals on purpose to secure their passage, by getting near the coast of Luconia. Many ships, after the middle of October, have been delayed about Pulo Sapata by calms and light winds ; and by the southerly currents, prevented from making any progress

for several days: induced by this, to stretch over to the eastward for the coast of Palawan, they have been perplexed by the numerous shoals between that coast and Pulo Sapata. Several ships have been nearly lost in attempting a direct passage from Pulo Sapata to the eastward. The ship *Arabian Star* got wedged between two coral rocks; fortunately the sea being smooth, and the tide flowing, she floated out without much damage: the reef was so steep, that bottom could not be obtained to lay out an anchor. The *Ardassier*, in October 1803, was involved several days among the coral reefs, above and under water, between  $7^{\circ}$  and  $8^{\circ}$  of north latitude, where she was obliged to anchor in the night. On some of the coral rocks had only five fathoms, although steering after the boat, apparently in the deepest places. The American brig *Pennsylvania*, in her passage up the China Sea, in December 1803, saw fourteen shoals above water in crossing over towards the coast of Palawan. This vessel passed Achen Head early in November, went through Malacca Strait, and after getting nearly to Pulo Sapata, with the north-east winds, stood to the eastward amongst the shoals, where she got embarrassed and delayed in the passage. Notwithstanding, this vessel made her passage to China in the strength of the north-east monsoon, up through the middle of the China Sea, arriving at Macao in January 1804.

The ship *Fanny*, in October 1803, bound to Canton, in crossing over towards the coast of Palawan, was wrecked on an extensive chain of reefs in latitude  $9^{\circ} 44' N.$  and longitude about  $114^{\circ} E.$ : the rocks on these reefs are mostly all covered at high water, and the rise and fall of the tides about twelve feet perpendicular during the springs.

To avoid a delay of time from light variable winds, or southerly currents, about Pulo Sapata, and prevent the embarrassment which must ensue, if the track from Sapata to the eastward amongst the shoals is followed, it may be most advisable, when the season is so far advanced as the middle of October, when leaving Pulo Aor, to steer for the North Anambas and North Natuna; and from the North Natuna to the eastward, through the channel between the Louisa Shoal and Royal Charlotte Shoal. The Louisa Shoal appears to be tolerably well known; the *Britannia* makes it in latitude  $6^{\circ} 23' N.$  and  $4^{\circ} 3' 30'' W.$  from the Mangsee Islands, by chronometer. Captain Don, in 1801, made it in latitude  $6^{\circ} 20' N.$  and  $5^{\circ} 12' E.$  from North Natuna, by chronometer, or  $8^{\circ} 44' E.$  from Pedro Branco. It appears that this shoal is in longitude about  $113^{\circ} 18' E.$  or  $5^{\circ} 12' E.$  from North Natuna.

The Royal Charlotte Shoal seems to be in latitude  $6^{\circ} 56' N.$  by his Majesty's ship *Resistance*, and in longitude  $113^{\circ} 54' E.$  or about twelve leagues to the east-

ward of the Louisa Shoal. Both these shoals have high breakers on them, and may be approached in the day-time with a steady breeze, being apparently steep to. When past them, a course to see the island of Balambangan is proper, passing that and Balaback, at any convenient distance; steer for the channel on the coast of Palawan, between the inner shoals (or those situated near the coast) and the Half Moon and Royal Captain's Shoals in the offing: these two shoals are probably at a greater distance from the land, than generally marked on the charts, as several ships have lately passed through this channel in the day-time, without perceiving them, or any of the inner shoals, from the mast-head; from which it may be inferred, that this channel is much wider than the passage near the shore within the inner shoals. On making the south-west end of Palawan, by preserving a distance of from nine to ten leagues from the land, seems to be a fair track outside of all the inner shoals, and within all those situated in the offing. Keeping afterwards, at the same distance, or nearer the land, pass in sight of the north end of Palawan, from thence to see Luban or Goat Island; and, if easterly winds prevail, it may be requisite to pass near the Calamianes, and close to the coast of Luconia. But this coast should not be kept very close on board, if westerly winds blow, which they frequently do at this season, accompanied by thick weather at times.

Cape Bolinao, in latitude  $16^{\circ} 28' N.$  should not be approached very close, being encircled by rocky ground and shoal water: the current from the northward at times setting into the deep bay on the east side of the cape, is also an inducement to keep at a reasonable distance from it, when the weather is precarious, or in crossing the bay to the eastward.

From Cape Bolinao ships will generally be able to pass to the eastward of the Pratas Shoal, except the current is setting strong to the westward, or blowing strong from the north-eastward. It is commonly preferred to keep near the coast of Luconia to Cape Bajadore, the better to secure the falling in well to windward, on the coast of China. There is shelter amongst the Babuyan Islands, to the northward of Luconia, for ships in distress. The London, in 1764, after being disabled by a ty-foong close to the Bashee Islands, coming to China by the eastern passage, anchored amongst these islands, under Fuga\*, where she repaired her damages, and procured wood and water. The channel between this group and the Bashee Islands is wide and safe.

Ships which sail well may probably, by the coast of Palawan and Luconia, as mentioned above, make a tolerable passage to China in October, November, and

\* November 3, 1764, she anchored on the south-west side of Fuga, and repaired her damages.

perhaps December : for westerly winds aré frequently about the west end of Palawan and Balaback in October and early in November.

A vessel from Bombay, some years back, from Sincapour Strait, passed to the northward of the Natunas, crossing then over to the eastward, carried strong S. W. and westerly winds along the coast of Palawan, and proceeding along the west coast of Luconia, made a quick passage to Macao, arriving there in the early part of November.

The East India Company's ship Lord Walsingham, passed the Natunas 17th October 1787 ; had steady south-westerly winds in passing along the west coasts of Palawan and Luconia, and made a quick passage to China, making this coast in latitude  $22^{\circ} 44' N.$  on the 30th October 1804. The Lord Castlereagh sailed from Bombay on the 14th of September ; remained two or three days at Malacca, and arrived on the 3d November at Macao, being about forty-six days at sea on her passage to China. Finding October well advanced, when clear of Sincapour Strait, Captain M'Farlane steered direct for the North Anambas and Natunas ; and passing between the Louisa and Royal Charlotte Shoals, saw afterwards Balambangan and Banguay, &c. : was delayed a little when near the west end of Palawan, by a gale of short duration from the northward ; after which experienced favourable weather, in passing through the channel between the shoals ; and from thence along the coast of Palawan and Calamianes, and along the coast of Luconia, to China. Even in December, had the Pennsylvania followed the same route as the Lord Castlereagh, in place of being perplexed and delayed by the numerous shoals, it is probable she would have arrived much sooner in China, and avoided the dangerous track through which she navigated.

Of late years, many ships have passed over all the situations, in which the shoals near the coast of Luconia are placed on the charts, and no dangers seen. It is now supposed, that the Mirabella and North Maroona do not exist ; and that there are no shoals, at a distance from this coast, in the offing, except the Scarborough Shoal. The survey of this shoal, made by orders from the admiral at Manilla in 1800 (April), appears to be the most correct, a frigate having been sent for the purpose.

North part in latitude  $15^{\circ} 12' 40'' N.$  } being  $8\frac{1}{2}$  miles | East part in longitude  $3^{\circ} 06' 40''$  } West from meridian of Manilla,  
South part . . .  $15^{\circ} 01' 00''$  } from N. to S. | West part . . .  $3^{\circ} 16' 15''$  } or  $9\frac{1}{2}$  miles from E. to W.

The nearest part of the shoal 131 nautic miles distant from Point Caponis.

The situation of the Pratas Shoal, from observations made by Captain G. Robertson, appears more correct than any other. The limits ascertained by him were the following :—North-east point, latitude  $20^{\circ} 52' N.$  ; longitude  $116^{\circ} 47' E.$  North-

west point, in latitude  $20^{\circ} 52' N.$ ; longitude  $116^{\circ} 34' E.$  South-east point, latitude  $20^{\circ} 38' N.$ ; longitude  $116^{\circ} 26' E.$  South-west point, in latitude  $20^{\circ} 39' N.$ ; longitude  $116^{\circ} 35' E.$ : and Pratas Island, in north latitude  $20^{\circ} 47' N.$ ; longitude  $116^{\circ} 37' E.$

In April there is light southerly winds, and land and sea breezes on the west coast of Luconia. A ship will get to the northward speedily here at this time; and also up the coast of Cochin China in the same month. In March the current runs constant to the southward, from Pedro Branco, in the entrance of Sincapour Strait, to Pulo Timoan, and light winds are prevalent from north-eastward, which retards a ship in her progress to the northward hereabout, at this period.

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## VI. ILLUSTRATIVE DESCRIPTION OF THE INNER PASSAGE FROM CHINA.

THE passage to China by the Macclesfield Bank has been preferred during the strength of the south-west monsoon. In returning from China, the same track perhaps will be most expeditious during the months of March and April: but at every other time of the north-east monsoon, the Inner Passage, by the coast of Cochin China, seems preferable. It is shorter than the route by the Macclesfield Bank, but the great advantage derived, is the ease afforded to ships leaving the Grand Ladrone, by steering immediately before the wind, when blowing strong: whereas, being obliged to steer about south-south-east at these times, for the Macclesfield Bank, which frequently brings the wind and sea before the beam, strains deep loaded ships greatly, in proceeding by the outer track. Many ships, in blowing weather, destined to Malacca Strait, have strained so much on hauling up for the Macclesfield Bank, as to render it needful to bear away for the Inner Passage, that they might be enabled to gain upon the pumps. Other ships, by persevering in the Outer Passage, have laboured and strained exceedingly by the cross sea, in hauling up for the Macclesfield Bank: and three ships have been lately known to founder from this cause; in one of which upwards of a hundred men perished, exclusive of other missing ships which have sailed from China. Had those ships, in place of carrying sail in crossing from the coast of China towards the Macclesfield Bank, at leaving Macao, steered S. S. W.  $\frac{1}{2}$  W. the direct course for the Inner Passage, they most probably would

not have strained in the least; whereas some of them strained so much, as to start some of their butt ends, and consequently soon filled with water.

Probably, a well found and fast sailing ship, from Canton River, bound to the straits of Malacca or Sunda, will make a shorter passage by adopting the route to the westward of the shoals, than by any of the eastern passages, either to the eastward or westward of Luconia, during any period of the south-west monsoon; provided she embraces the opportunity of sailing from the river with a south-easterly or favourable wind, which often prevails for several days at a time, during the south-west monsoon.

Several ships, of late years, have left Canton River in August and early in September, bound to Malacca Strait; and, proceeding by the Inner Passage, along the coast of Cochin China, generally reached Pedro Branco, and sometimes Malacca, in thirty days. Ships bound to India, have left the Grand Ladrone in May; and in every month of the south-west monsoon, have proceeded by the Inner Passage to Malacca Strait, except June and July. In July, and the latter part of June, perhaps no English ships have chosen the Inner Passage from China; but in these months, passing up the coast of Cochin China, we experienced very little current to the northward. In those months, the land winds prevailing in the night, must greatly favour a ship's progress to the southward, especially if she keeps near the shore in the night, and stands well into the bays, with the south-easterly breezes in the day. When a ship in this season approaches Cape Padaran, she will generally benefit no more by land breezes in the night; but a fresh south-westerly monsoon, and sometimes a lee current, will be experienced. The passage from hence to Pulo Aor may be tedious, the prevailing winds being from the south-westward.

If near Cape Padaran, and blowing strong from the south-westward, about the full or change of moon, shelter may be taken, there being anchorage in a small concavity, or indentation of the land, on the south-west side of the bay, where there is fresh water. There is a harbour at the bottom of this great bay; the entrance is between two reefs, and rather narrow: in the harbour is from four to five fathoms soft ground. The coast of Cochin China furnishes several good harbours between Padaran Bay and 14° N. latitude, almost every inlet being a safe harbour.

When abreast of Cape Padaran, and continuing to gain ground, work to the westward, keeping near Pulo Ceicer de Terre; and when past it, work near the land until near Britto's Bank, passing without it: may then stretch over for the coast of Cambodia, and work along it to Pulo Oby. The soundings are very regular along this coast, and the land scarcely visible from the deck in eight or nine fathoms water, it being remarkably low. These depths appear sufficiently near for a large ship to

stand to on most parts of the coast of Cambodia. When tacking in eight fathoms, to the north-westward off Pulo Condore, the land was just visible from the deck, like a low wall nearly even with the horizon: eddies within us, at no great distance, seemed to indicate more shoal water on some of the flat banks contiguous to this low coast.

From Pulo Oby, if the wind does not incline much from the southward, a ship will speedily reach the coast of Tringany; and, keeping near the land, will soon proceed to the strait of Sincapour, by the help of squalls or breezes from the coast. If requisite, she may keep the Malay coast on board, and pass to the westward of Pulo Timoan, Pulo Tingy, and the islands, in soundings of eight and nine fathoms, which is safe in the day; and when amongst the islands in the narrow part of this passage, it may be proper to anchor at night, on account of some rocks very little above water, but may be always observed in day-light. There is generally weak tides among these islands near the shore. When approaching the north part of the reef off Point Romania, must keep at a greater distance from the low land in entering the strait of Sincapour.

Notwithstanding what has been mentioned, relative to the passage from Cape Padaran to Sincapour Strait, if the current is found to run strong on the coast of Cambodia against a ship, and prevent her from gaining ground, it may be in such case proper to stand off from the land to a reasonable distance, where it may happen that the current is weaker than near the shore.

American ships depart from Canton River in every month of the south-west monsoon; and several of them make a direct passage to the southward by the Macclesfield Bank: but whether they reach the straits of Banca or Gasper, it is not positively ascertained. It is probable they either proceed to the westward of Borneo, or between Mindora and the Calamianes.

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#### VII. APPOSITE REMARKS FOR THE INNER PASSAGE FROM CHINA, DURING THE NORTH-EAST MONSOON.

THE latitude of Canton Factories is  $23^{\circ} 07' 10''$  N.; and by mean of five immersions, and seven emersions of the first satellite of Jupiter, the longitude  $113^{\circ}$



14' E. from Greenwich. The Grand Ladrone, called by the Chinese Ty-man-shan \*, is in latitude  $21^{\circ} 57'$  N. and thirty miles east from the meridian of Canton Factories, by mean of many chronometers. A direct course S. S. W.  $\frac{1}{2}$  W. from this island, will carry a ship about mid-channel, between the Taya Islands and the St. Esprit Bank. The latitude of the northernmost Taya Island is  $19^{\circ} 57'$  N. and it is  $2^{\circ} 37'$  W. from Grand Ladrone by chronometer. These islands are high, particularly the northernmost and southernmost, which extend about N. E. b. N. and S. W. b. S. from each other five or six leagues. From the southernmost island, a high sand bank projects to the north-north-eastward several miles: the soundings very regular to the eastward of it, twenty and twenty-one fathoms, at three miles distance. The Taya Islands are barren and rugged; the channel between them and Hai-nam Head is wide and safe. It has been also mentioned by a Hai-nam pilot, that there are safe channels between some of them. The latitude of the St. Esprit Bank is said to be  $19^{\circ} 30'$  N. but of extensive limits: the longitude, or true situation of this bank, is very imperfectly known; it probably bears about S. b. W.  $\frac{1}{2}$  W. from the Grand Ladrone. In 1789 the Milford got upon its eastern verge; perceiving the rocks alongside, on sounding had eight fathoms: had several casts of this depth, when they hauled to the eastward, and suddenly got out of soundings on the bank. There is supposed to be danger on the north-west part of this bank, for which reason it has generally been avoided. The Grosvenor had  $6\frac{1}{2}$  fathoms; and, as few ships have passed over it, there may be less water on some places of the coral ridges. But few vessels having got soundings on the St. Esprit Bank, gives room to suppose that its extent is confined within narrower limits than represented on most of the charts. From the Grand Ladrone to the latitude of  $17^{\circ}$  N. the current seldom runs strong in the north-east monsoon, except when blowing strong, or near the land. In the months of September and October, from the entrance of Canton River, it sometimes sets in a direction between W. S. W. and W. N. W. from one and a half to two miles an hour, sweeping along (and through the channels amongst) the islands to the westward of Macao. Here a westerly current, generated by the freshes from the river, seems to prevail in most months of the year, but not constant, there being a kind of tides at times.

As the distance from the coast is increased, a decrease of the westerly current ensues; and it seldom runs above a mile an hour, in the direct track from the

\* In the Chinese language, Ty, or 大 great, &c.; and Shan, wrote 山 is an insulated hill, mountain, or a high island.

Grand Ladrone to  $17^{\circ}$  N. latitude, going the Inner Passage; and mostly governed in its direction and velocity by the course and strength of the wind.

A course steered from the Grand Ladrone S. S. W.  $\frac{1}{2}$  W. will, if not effected by oblique current, place a ship about  $3^{\circ} 00'$  W. from Ladrone, when she has reached the parallel of  $17^{\circ}$  N. latitude, which is well to the westward of the north-west limit of the shoals: this limit is uncertain, but does not exceed  $2^{\circ} 46'$  W. from Grand Ladrone, and probably much less.

These shoals, commonly called Paracels, are the same group as those distinguished by the different names of Triangles, Amphitrite, Spectacles, St. Anthony's Girdle, Lincoln, &c. The easternmost danger of this group (or chain of groups) is probably that seen by the Bombay Merchant, 19th May 1800; an extensive reef of breakers, in the form of the letter A, with the angular point to the eastward, and small rocks appearing above water, when within three quarters of a mile of it. Each of the legs appeared six or eight miles in length, forming a smooth harbour apparently between them, with an entrance to the westward. The latitude of this shoal, by noon observation, was  $16^{\circ} 06'$  N.; longitude by sun and moon, at 4 P. M.  $112^{\circ} 48'$  E. and by chronometer made it in  $112^{\circ} 54\frac{1}{2}'$  E.

The Middlesex, in 1789, on the passage to China, saw a reef with some rocks above water, in latitude  $15^{\circ} 58'$  N. which probably was the same seen by the Bombay Merchant. The shoal seen by the Earl Lincoln, in latitude about  $16^{\circ} 35'$  N. is perhaps very little to the westward, or nearly on the same meridian with that seen in the Bombay Merchant: but, excepting the shoal determined by this ship, there appears to be no other belonging to the Paracel group, whose position in longitude is known.

The northernmost limit of danger is about  $17^{\circ} 03'$  or  $17^{\circ} 04'$  N. seen by the Abergavenny: the longitude uncertain.

The western and southern limits of this group are unknown. Although in most charts the southern part of them is placed from  $11\frac{1}{2}^{\circ}$  to  $12^{\circ}$  N. latitude, it is probable, if a survey is made, that they may not extend so far to the southward as 14 degrees; and probably be found, that their southern limit is not far from  $15^{\circ}$  N. latitude.

From the Grand Ladrone,  $2^{\circ} 50'$  W. by chronometer, is clear to the westward of all danger, as far to the southward as  $16^{\circ} 12'$  N. And  $3^{\circ} 30'$  westward from it, is to the westward of the group down to  $13^{\circ} 50'$  N. And probably three degrees west from Grand Ladrone may be clear to the westward of their western limit.

The northern limit of this group of shoals, being apparently  $17^{\circ} 04'$  N. and the eastern limit  $112^{\circ} 54'$  E. from Greenwich, or fifty miles west from meridian of Grand

Ladrone, it will probably be discovered, on investigation, that their extent on a meridian does not much exceed two degrees to the southward ; nor their greatest extent, on a parallel to the westward, much above a degree, or one and a half degree of longitude : although, from the general obscurity in which this group of shoals has been so long enveloped, it is impossible to assign, with precision, any southern or western limits to them. They are said to be reefs of coral rocks, interspersed with sand banks, having wide channels between some of them ; and several low islets, with shrubs and fresh water on two or three of them, seem to be situated near the northern part of the group, between the latitude of  $16^{\circ} 30'$  and  $17^{\circ}$  N.

Being in latitude  $17^{\circ}$  N. and  $3^{\circ}$  W. from Grand Ladrone by chronometers, or about  $3^{\circ} 10'$  W. if by account, may then steer S.  $\frac{1}{2}$  W. to S. b. W. until  $3^{\circ} 30'$  W. from Ladrone by chronometers or account ; continuing the same course to the southward, as circumstances may require.

In case of thick weather, precluding a knowledge of the longitude by chronometers, and by a stronger westerly current than expected, the Island Pulo Canton is seen ; there is a wide channel between it and the main land, with soundings generally from 26 to 34 fathoms in it, which may be chosen, if Pulo Canton cannot be weathered. This island is in latitude about  $15^{\circ} 24'$  N. and  $4^{\circ} 37'$  W. from Grand Ladrone by chronometers. There is a low island at a few miles distance, off the north-west end of Pulo Canton, with foul ground to the northward of it : and, it is supposed, there may be some shoal water over the foul ground, said to be situated a little northerly from Pulo Canton. This island is high, and of a level appearance when seen from the southward, and may be seen from the deck at eight or nine leagues distance. It is inhabited and cultivated on the west side.

The coast of Cochin\* China is mostly all high land ; and safe to stand to near the shore, there being no dangers but what are generally visible above water ; and the depth is in most places sufficient for ships of any description, within a very small distance of the shore. On the northern part of the coast, there are land breezes at times in the mornings, near the shore, in the early part of the north-east monsoon : and also to the southward, light land breezes happen at times in November. In this month, about Turon, light land and sea breezes have been experienced, with occasional calms ; and sometimes strong north-east gales, with much rain and dark cloudy weather. But, in general, the wind most prevalent, even in November and October, and frequently September, is the north-east monsoon, from Cape Turon to Cape Padaran.

\* It is by the Chinese called Ouam.

The coast of Cochin China abounds with bays and harbours. The following are the best harbours, most of them fit for large ships :

Turon Bay, or Harbour, is safe for ships of any size, where they are sheltered from all winds. Cape Turon, which forms the south-east entrance into the harbour, is in latitude  $16^{\circ} 05' N.$  and is  $5^{\circ} 23' W.$  from Grand Ladrone by chronometers.

The Island Cham-Callao, or Champella, distant about six leagues from Cape Turon to the south-eastward, affords a channel between it and the main; the depth of water generally from six to eight fathoms, which may be estimated a harbour, the island and main affording shelter from most winds.

Cape San-ho, which is a high bluff point of land, and the eastern side of the entrance into the harbour of Quinhone, is in latitude  $13^{\circ} 44' N.$  This cape has some small islands off it, and a little to the northward. Cape San-ho must be passed very close in going into Quinhone Harbour, the western part of the channel being very shoal towards the sandy point. There is deep water in the harbour, and it is very secure when in it; but there is a bar at the entrance, which is thought to have only 3 or  $3\frac{1}{2}$  fathoms on it, even though keeping close to the eastern shore, which will prevent large ships from entering this harbour.

Phuyen Harbour is one of the best in the world. The entrance is in latitude  $13^{\circ} 22' N.$  about four leagues to the southward of Pulo Cambir, having ten or eleven fathoms water, on either side of a small island lying nearly in the middle of the opening, which is about two miles wide. The entrance leads into three harbours; that to the north-westward, called Vung-Chao, is the best, being completely land-locked, and is spacious and secure, with a cultivated country around.

The harbour on the south side of Cape Varela, called Ong-ro by the natives, and by Mr. Dalrymple Varela Harbour, is small, but appears safe. The funnel over the cape, kept N. N. W. is a leading mark into the entrance of this harbour, soundings nine, eight, and seven fathoms in the middle, shoaling on each side. There is fresh water on the western side of this inlet or harbour. About seven leagues to the southward of Cape Varela is an opening into a spacious bay or harbour, on the south side of which is the harbour and village of Hone-Cohe; and on the north part of this bay are several islets near the entrance of a cove or harbour, which is a kind of bason environed by high land, with soundings in it from fourteen to eighteen fathoms, secured from all winds: but there are no supplies procurable here, it being inhabited by a few fishermen.

Tre Island is in latitude  $12^{\circ} 16' N.$  which forms a good harbour within it, there being a passage both to the northward and southward of Tre Island into the harbour;

the soundings seven, eight, and nine fathoms, in the channels between the island and the main. This harbour is formed by Tre Island to the north-east and eastward, and some small islands to the southward; between which and the shore, or between them and Tre Island, the passage is safe. These passages are narrow, and Tre Island, in passing along shore, appears as a projecting part of the main land; and to a stranger will appear so, until very close to the shore; and the channel or harbour within it beginning to open, which leads into a safe haven; in or out of which, by means of the different channels, the navigation is easy, though contracted. A little to the northward of this, is the road and small river of Nhiatrang; the city of this name being a few leagues inland: it is one of the strong posts of the king of Cochin China's dominions.

To the north-north-eastward off Tre Island, at six or seven miles distance, is an island generally called Pyramid Island, which is the most conspicuous in passing along the coast: there is some small islets near it, and one at a considerable distance to the northward.

Camraigne Harbour is one of the best on this coast; the entrance is in latitude  $11^{\circ} 49' N.$  on the south side of a large island, taking a direction to the north-westward; the soundings are from sixteen to eighteen fathoms in the entrance, and the same depth nearly throughout the outer harbour, which is secured from all winds by the island without. To the north-westward of the outer harbour is the opening which leads into the inner one; this is also a safe and spacious harbour for ships of any size. Camraigne is the southernmost good harbour on this coast; Padaran being too contracted for large ships. A little southward of Camraigne entrance, there is an opening into a deep bason, having high mountains all round, which is little known.

In clear steady weather, or the wind settled from the north-eastward, any part of the coast of Cochin China may be approached with safety, and coasted along at any convenient distance; but when the weather is thick and unsettled, or the wind inclining from the eastward, it is then prudent not to make the land, until near Cape Varela; the wind from it to the southward seldom inclines much towards the shore, but mostly follows the direction of the coast in the north-east monsoon.

The Island Cambir is a sloping regular island, appearing low and level, when seen at a distance: close to the southward of it are some rugged rocks called the Two Paps. Pulo Cambir is in latitude  $13^{\circ} 33' N.$  and nearly on the meridian of Cape Varela; it is about four leagues southward from the entrance of Quinhone Harbour, and nearly the same distance to the northward of Phuyen Harbour (or Vung Chao). Within Pulo Cambir is a safe channel, with different depths in it, generally from ten to fifteen fathoms. A little to the southward of it, and north-

ward from Phuyen Harbour, it is an opening into a small harbour called Cou-mong, fit for small vessels. A little to the southward of Phuyen entrance is the Island Maignia ; and about four leagues to the southward of this island, and 6 or 6½ leagues north-westward from Cape Varela, a high conical hill, or mountain, is situated by itself near the sea, called Conical Mountain (or Epervier by the French). Inland from this are high mountains, which terminate a little to the southward ; whereby a chasm or valley is formed, between them and the Cape Varela chain of mountains, with low land in it facing the sea, around the bottom of the bay of Phuyen.

Coming from the northward, when Conical Mountain is seen, it may be useful as a mark, to point out the distance from Cape Varela ; if night is approaching, or the funnel on the mountain over the cape obscured by clouds.

A little to the southward of Conical Mountain, is a piece of sloping level land, having a perpendicular rock upon it, similar to the funnel (or pagoda) over Cape Varela, but is only seen when near the shore. The land at the bottom of the bay of Phuyen, between Conical Mountain and the cape, being low facing the sea, renders it dangerous getting into the bay in the night, or in thick weather ; particularly with the wind blowing strong from the eastward.

About four or five miles N. ½ W. from Cape Varela, there is a large rock, with some small ones even with the water's edge, near it. This rock has a large stone uppermost, and appears when near, as if placed by art. A hole is perceived through below the upper stone, when abreast ; from thence it has been called Perforated Rock. There is a channel between it and the main land, having twenty fathoms water in it, which may be used, if requisite. To the westward and north-westward of this rock is the bay of Phuyen ; the land from Cape Varela projecting to the north-west, forms the bay.

Cape Varela is in latitude 12° 55' N. and in longitude 109° 25' E. from Greenwich ; or from 4° 19' to 4° 20' W. from Grand Ladrone, by means of many chronometers ; in clear weather it is easily known by a large and conspicuous rock \*, resembling a funnel or pagoda, which is situated on the summit of the mountain, whose eastern declivity forms the projection of the cape, called Pagoda Cape by the Portuguese, from the near resemblance of the rock on the mountain to a pagoda. When the summit of the mountain is not obscured by clouds or vapours, the funnel or pagoda is conspicuous, and may be seen at sixty miles distance from the deck of a large ship, either from the northward or southward ; but frequently a haze prevails over the land, especially in the north-east monsoon, preventing it from being seen at great distances. When

\* The natives call it Da-bia.

first perceived in clear weather, coming from the northward, the projecting part of Cape Varela appears insulated from the mountain ; the land between being lower than the steep cliffs which front the sea, and forms the cape. When abreast of Cape Varela, at a few leagues distance, the appearance of the land about it seems of the following aspect :



From the latitude of  $15^{\circ}$  the current increases in velocity to the southward ; and when near the land, in the strength of the north-east monsoon, from latitude  $14\frac{1}{2}^{\circ}$  or  $14^{\circ}$  N. to  $12^{\circ}$  or  $11\frac{1}{2}^{\circ}$  N. it oftens runs to the southward, in the direction of the coast ; at the rate of forty or fifty miles in twenty-four hours. Beyond these limits it is not so strong ; nor is it constantly so, within the limits mentioned. From latitude  $14^{\circ}$  N. to Cape Varela, the course is about S.  $\frac{1}{4}$  E. from Cape San-ho, and may be coasted at any discretionary distance in settled weather. If the land has not been seen before reaching the latitude of Cape Varela, it ought then to be approached close, and continued at a small distance in passing from hence to the southward.

Being abreast of Cape Varela, at from three to five miles distant from it, a south course, or S.  $\frac{1}{4}$  E. is fair from point to point for six or eight leagues. In the night, steer south from the cape eight or nine leagues, to give a birth to Pyramid Island and the others near it. Pyramid Island is in latitude about  $12^{\circ} 22'$  N. and will be perceived, when passing a few miles without it in the night (if clear), of a conical appearance, like a haycock. About nine leagues more to the southward, nearly in latitude  $12^{\circ}$  N. is the Water Islands, which are middling high ; and may be perceived, when passing near them in the night. Being thus far to the southward, steer S. b. W. or rather more westerly ; if the land seems above three or four leagues distant, to get a good sight of the mountain to the southward of Canraigne Harbour. This is an high oblong mountain. When near it in the night, coming from the northward, it may be distinguished from any of the other prominent head-lands, by its great magnitude, and high appearance ; sloping down towards the sea with a gradual declivity. The steep cliffs, formed by this mountain towards the sea, are sometimes called False Padaran ; but generally False Cape Varela, there being a rock on the mountain inland resembling a little the pagoda over Cape Varela, but not near so conspicuous. The steep cliffs forming this False Cape \* are in latitude

\* Called by the natives Mui-dayaich. Mui, signifies a cape, or head-land, in the Cochín Chinese language.

about  $11^{\circ} 45' N$ . The southernmost part of this high land trends away to the south-westward, and forms the north side of the great bay of Padaran (or Phanran). Do not keep very close to this part of the high land, on account of a small island situated near the shore, with some foul ground about it. Forty fathoms water in this part is close enough to the land in the night.

When abreast of the southern part of the high land of False Cape Varela, steer S. S. W. or S. S. W.  $\frac{1}{4}$  W. across the mouth of Padaran Bay. Here the current frequently is deflected from the contour of the coast to the S. S. E. which requires at these times a S. S. W. or S. S. W.  $\frac{1}{4}$  W. course to counteract it, in crossing the bay in the night for Cape Padaran, to prevent being carried by the current at too great a distance from the cape.

Cape Padaran \* is in latitude  $11^{\circ} 21' N$ . and  $4^{\circ} 44'$  West from Grand Ladrone by chronometers; it is a high piece of land, and the projecting part of the continent to the south-eastward: having the deep bay of the same name to the northward; and a neck of low land between it and the mountains to the westward, which makes it very conspicuous. When near Cape Padaran, to the southward, the neck of low land is seen, if near the shore; but at the distance ships pass, it is seldom perceptible; which makes Cape Padaran appear insulated from the mountain westward of it. This chasm in the land is generally called the *Gap of Padaran*; and by the natives *Caná*.

The distance from being abreast of the high land of False Cape Varela, across the bay to Cape Padaran, is about eight leagues; and when abreast of this bay in the night, the land is not seen to the westward, it being low at the bottom of the bay near the sea. There is soundings across the bay; forty to fifty fathoms being the general depth in passing, if not far out. From fifty five or sixty fathoms, the bank shelves with a steep declivity to seaward, where no bottom is got with one hundred fathoms of line.

Steering across the mouth of Padaran Bay, S. S. W. to S. S. W.  $\frac{1}{4}$  W. in the night, Cape Padaran will soon be perceived, a little on the starboard bow, or nearly ahead, which cannot be mistaken; there being no other land seen in the night in crossing the bay, from False Cape Varela Mountain, until Cape Padaran is seen to the south-westward, which will be visible at several leagues distance, unless the night is very dark.

When Cape Padaran is seen, steer towards it; passing at from one league to two leagues distance from it in the night. From this situation a course S. W. b. W. will

\* Called by the natives Mui-din.



be fair, to pass about the same distance without Pulo Ceicer de Terre ; but in passing Cape Padaran, if it is not above one or two miles distant, then a south-west course will be proper to steer, on purpose to pass a few miles outside of Pulo Ceicer de Terre.

Pulo Ceicer de Terre is in latitude  $11^{\circ} 13' N.$  and  $4^{\circ} 56' W.$  from Grand Ladrone by chronometers ; and bears from Cape Padaran about S. W.  $\frac{1}{4}$  W. five leagues : is small, consisting of a heap of rocks, with a little grass on the central part. When first discernible, a small peak appears, like a boat's sail, or small turret ; this being the most elevated part of the island, and may be visible from the deck of a large ship, at  $4\frac{1}{2}$  to 5 leagues distance. There is no danger about this island, except very near it. A sort of prong or spit of rocks projects out from the E. N. E. and W. S. W. extremities of the island, above and under water, to a small distance : and within it, towards the gap of Padaran, lies the bank of Breda ; between which and Pulo Ceicer de Terre is a channel of six or seven fathoms water.

Around the semicircular piece of land which forms Cape Padaran, the water is deep close to the shore, and continues so, until about half way between it and Pulo Ceicer de Terre : the depth then decreases to seventeen, fourteen, and twenty fathoms irregular soundings, when within four or five miles of this island. The soundings about Pulo Ceicer de Terre are, in general, irregular ; seven and eight fathoms when near it ; and overfalls from seventeen or sixteen fathoms, to nine or ten fathoms may happen, when to the southward of the island, at from three or four miles to three or four leagues distance from it : but the shoalest water is near the island ; it deepening in the south part of the channel, towards the Holland's Bank. Pulo Ceicer de Terre, north about four leagues, are overfalls from eighteen to twelve fathoms ; and when bearing from north to N. b. E. the depths are very uneven.

In standing to the southward from Pulo Ceicer de Terre, towards the Holland's Bank, the depth increases to twenty fathoms ; and sometimes to twenty-four, twenty-five, and twenty-six fathoms ; these being the general depths, near the north-west edge of the bank. The channel between the Holland's Bank and Pulo Ceicer de Terre, appears to be about six or seven leagues wide. And when Pulo Ceicer de Mer is not brought to the eastward of S. E. b. S. or S. E.  $\frac{1}{4}$  S. it is probable there may be not less than seven or eight fathoms over most of the north-east parts of Holland's Bank. With the easternmost hill of Pulo Ceicer de Mer S. E.  $\frac{1}{4}$  S. ; westernmost hill S. E.  $\frac{3}{4}$  S. ; and the rocky islet, which lies about four miles from the north-west end of Pulo Ceicer de Mer, a little open with the south extreme of the island S. E. b. S. southerly, had twenty-six fathoms ; our distance from Pulo Ceicer de Mer, about five leagues, having run seven leagues on a S. b. E. course, from

tacking in 11 fathoms near the shore, westward of Point Lagan; from thence deepened to 26 fathoms, where we tacked with Pulo Ceicer de Mer bearing as described, without perceiving any part of Holland's Bank.

Although it seems probable, that the north-east end of this bank may not be dangerous, it is known that the western part is unsafe for large ships; particularly so, when the centre of Pulo Ceicer de Mer bears from E. b. S. to E. S. E. distant about 7 leagues; and the low part of the island, which joins the two hills, just discernible from the deck of a large ship, or an elevation of the eye, about 22 feet; the soundings close to this part of the bank, are 23 and 24 fathoms; and by standing on the edge of it, the depth, when under 20 fathoms, decreases in a few cables lengths to 10, 6, and  $3\frac{1}{2}$  fathoms rocks, in several places. But the lead, if attended to, and hove quick, will point out a ship's position to be on the edge of the bank, before she is in danger.

The fleet from China, in Jan. 1805, by steering too much southerly from Cape Padaran, got upon this part of the bank, and three of them struck. His Majesty's ship *Grampus* in particular; but was lifted over the Pyramids by the swell, in 22 feet water by the lead, having struck very hard several times. From where these ships struck, the centre of Pulo Ceicer de Mer bore from E. b. S.  $\frac{1}{4}$  S. to E. S. E. distance  $6\frac{1}{2}$  or 7 leagues; the Gap of Padaran (or Cana) N.  $16^{\circ}$  E. The sand-hill, on the coast near the sea, about N. N. W.; and the level part of Pulo Ceicer de Mer, which joins the two hills, plain in sight from the quarter deck. Their latitude from  $10^{\circ} 38'$  to  $10^{\circ} 42'$  N.

The latitude of the centre of Pulo Ceicer de Mer is  $10^{\circ} 32' 30''$  N. and it is four or five miles in length, extending north-east and south-westward; and is about seven miles east from the meridian of Pulo Ceicer de Terre. It may be seen about eight leagues from the deck of a large ship; is well cultivated, and inhabited principally by fishermen, who pay a tribute in salt fish and bird-nets, annually, to the King of Cochin China. There is said to be good anchorage along the west side of this island. Some rocks, with a reef, project out about a mile from the north end and south-west part of Pulo Ceicer de Mer. The channel between it and Holland's Bank is safe. The passage between it and the rocky islet off its north-west end, at about four miles distance, also appears safe. From Pulo Ceicer de Mer the Great Catwick bears nearly south 8 or  $8\frac{1}{2}$  leagues, and Pulo Sapata about S.  $20^{\circ}$  E. 34 or 35 miles. The channel between Pulo Ceicer de Mer and the Catwicks being wide and clear, is preferable to that between the former and the Holland's Bank, when the weather is unsettled. The soundings, mid-channel, between the Great Catwick and Pulo Ceicer

de Mer, are from 40 to 46 fathoms. But, in favourable weather, the channel between Holland's Bank and Pulo Ceicer de Terre is that most frequented; and the following remarks may be of utility for this passage.

For a general rule to avoid the Holland's Bank, pass to the southward of Pulo Ceicer de Terre, at from 1 or 2 to  $2\frac{1}{2}$  leagues distance. Steering S. W. by W. or thereabout, bring this island to bear N. b. E.  $\frac{1}{2}$  E. before losing sight of it from the deck; and when it bears so, may then steer S. W. b. S. for six or seven leagues; and afterwards S. S. W.  $\frac{1}{2}$  W. direct from Pulo Aor.

In clear weather you will not be too near the Holland's Bank, when Pulo Ceicer de Mer is plainly seen from the deck, while it bears to the southward of S. E.  $\frac{1}{2}$  S. But when it bears from S. E. to E.  $\frac{1}{2}$  S. do not rise it more from the poop of a large ship, than to have the summit of the hills just discernible above the horizon: for should the low part of the island between the hills be visible above the horizon, from the poop, you will then be near the western edge of the bank, if the island bears from E. b. S. to E. S. E.

If it is clear weather, and passing Cape Padaran in the night, at three, four, or five miles distance when abreast, steer from S. W. to S. W. b. W. until the Gap of Padaran is open; and when it bears from N. b. E.  $\frac{1}{4}$  E. to N. b. E.  $\frac{1}{2}$  E. Pulo Ceicer de Terre is then on with it: the bearings of the Gap (when visible) affording correct means to know when approaching Pulo Ceicer de Terre; and also when to steer a direct course from the coast to pass clear of Holland's Bank. When the Gap of Padaran is brought to bear in the night N. b. E.  $\frac{1}{2}$  E. having then Pulo Ceicer de Terre in one with it, steer S. W. to S. W. b. S. for six or seven leagues; and then S. S. W.  $\frac{1}{2}$  W. for Pulo Aor, which will carry a ship well clear to the westward of Holland's Bank.

Should a ship be abreast of Cape Padaran, and the night become very dark, so as to render the Gap of Padaran imperceptible, a course steered from S. W.  $\frac{1}{4}$  W. to S. W.  $\frac{1}{4}$  S. will be proper for about twelve or thirteen leagues from the Cape, and then S. W. b. S. or S. S. W.  $\frac{1}{2}$  W.

It may be observed, as a further security from danger, that the water deepens to 22, 24, or 26 fathoms towards the north, north-west, and western verges of the Holland's Bank; whereas it shoals (excluding the overfalls) when in the northern side of the channel, near Pulo Ceicer de Terre; particularly to the westward of this island, the soundings are an infallible guide, the depth decreasing to 11 and 12 fathoms in general, at two or three miles distance from the shore; and deepens to 23 or 25 fathoms towards the north-west edge of the Holland's Bank. From 16 to 18

fathoms is a good track in passing from Pulo Ceicer de Terre to the westward, for five or six leagues ; and then edging away S. W. b. S. will deepen gradually.

From the west end of the Holland's Bank, the nearest part of Britto's Shoal is distant about 14 or 15 leagues, in a W. S. W. direction, which is a wide channel for passing between them in the night. Near the outer edge of Britto's Bank, the depth is said to be 17 fathoms, which is close enough to approach in the night. Going to China, in April 1792, passed without it in 17 and 18 fathoms, and saw no appearance of the bank : there being 2 or 3 fathoms water on the shoalest parts, it is seldom discerned, except when the sea runs high. Within this bank there is a channel 4 or 5 miles wide, having 12 or 13 fathoms near the edge of the bank, 9 fathoms about mid-channel, and 7 or 8 fathoms near Cow Island and the shore. The east end of Britto's Bank is about 5 leagues south-westward from Point Ke-ga, which is generally mistaken for Tiger Island. This point, when viewed from the eastward, appears to project far into the sea: the rocks forming it are elevated from the water in detached pieces, and being of a whitish colour, give it the aspect of a city in ruins, when viewed at a distance from the eastward. Over Point Ke-ga, the mountain Taicou is situated ; it is easily known, being the nearest high mountain to the sea, and of a more regular and beautiful sloping appearance than any other on this part of the coast.

In the night, if abreast of the high land of False Cape Varela, and blowing strong from the northward, with cloudy weather, render it unpleasant either to heave to, or to run for the channel between Pulo Ceicer de Terre and Holland's Bank, before day-light : you may steer S. b. W.  $\frac{1}{2}$  W. for Pulo Ceicer de Mer, the distance being upwards of a degree from False Cape Varela ; and pass through the channel between Holland's Bank and the former, which is 3 or 4 leagues wide ; the soundings in it irregular, from 11 and 12 to 17 and 20 fathoms, or between Pulo Ceicer de Mer and the high rock about 4 miles from north-west part of it, which appears a safe passage. But the channel to the southward of Pulo Ceicer de Mer, between it and the Catwicks, being wide and clear, is preferable to the former.

If abreast of False Cape Varela, or between it and Cape Varela in the early part of the night, and blowing hard with dark cloudy weather (which has sometimes happened in November and December), make it unpleasant for a stranger to run for any of these channels ; he may steer S.  $\frac{1}{2}$  W. or S. and pass to the eastward of Pulo Sapatã, as if returning by the Macclesfield Bank : the sea being clear of islands or dangers, for a great space to the northward of Pulo Sapata and Pulo Ceicer de Mer.

Pulo Sapata is 22 miles west from the meridian of Cape Varela, or  $4^{\circ} 42'$  W. from Grand Ladrone, by chronometers.

Coral Shoal, different depths on it from 10 to 25 fathoms, latitude  $9^{\circ} 45'$  N. and 25 miles W. from Pulo Sapata, by chronometers.

Centre of Pulo Condore,  $7^{\circ} 02'$  W. from Grand Ladrone, by chronometers.

Pulo Aor,  $9^{\circ} 10' 30''$  W. from Grand Ladrone, by mean of many chronometers.

*Note.*—Exclusive of the Reef extending from the Little Catwick, there is said to be a reef of rocks even with the water's edge, 3 or 4 miles to the eastward of the Great Catwick, in the passage between these two islands.

**MEMOIR**  
**OF A**  
**CHART,**  
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**OF THE**  
***STRAITS OF MALACCA AND SINCAPOUR.***

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**1805.**



# MEMOIR

ON THE

## NAVIGATION OF THE STRAITS OF MALACCA AND SINGAPOUR.

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### I. TO ENTER SINGAPOUR STRAIT IN HAZY WEATHER.

**D**EPARTING from Pulo Aor, steer so as to bring it to bear about north when disappearing ; if the large Saddle Hill of Bintang is seen, and bearing south, it is a safe guide to pass along the eastern edge of the reef, which extends to the north-east and eastward, from Point Romania.

Do not bring Bintang Hill to the eastward of south, until Pedro Branco is seen bold from the deck, for the hill south leads a ship near the north-easternmost patch of the reef ; but is a safe bearing if the compass is true. When the centre of Bintang Saddle Hill bears exactly south, the summit of the Little (or False) Hill is then just open with the western shoulder of the Large Saddle Hill ; and at a great distance they appear as one hill.

In hazy weather, Bintang Hill is seldom visible, until past the eastern part of Romania Reef ; in which case, having Pulo Aor disappearing about north, a S. b. W. to S. S. W. course may be requisite to counteract the south-easterly currents, prevalent in the north-east monsoon ; or strong ebb tides setting out of the strait to the E. N. E. or north-eastward. When the low land is seen to the westward, coast it along at  $3\frac{1}{2}$  or 4 leagues distance, until the low sloping hill False Barbucit is seen, which is near the sea, and discernible much sooner when hazy than Barbucit Hill, appearing like a tope of trees more elevated than the coast. When it bears W. S. W.



15 fathoms is the fair track; when W.  $\frac{1}{4}$  S. and W.  $\frac{1}{2}$  S. overfalls, from 16 to 13 fathoms or less, may happen: for with False Barbucit Hill, W.  $\frac{1}{4}$  S. Barbucit Hill about W. S. W. and Bintang Hill S.  $\frac{1}{2}$  W. there is a shoal patch on the eastern bank, with the least water 8 fathoms on it, to 10 and 11, the general depth, hard ground. Ships happening to get a cast of 8, 9, or 10 fathoms on this spot, in thick weather, when the hills are not seen, judge these soundings to be on the edge of Romania Reef, and haul more to the eastward; whereby they are liable to fall to leeward of the strait, if unacquainted.

In coasting along at  $3\frac{1}{2}$  of 4 leagues distance, or less, with the land plain in sight, when False Barbucit Hill bears about W. b. S. you are then approaching near the northernmost patch of the reef, and shoal spot on the eastern bank. And when False Barbucit Hill bears about W.  $\frac{1}{4}$  S. if a cast of 10, 9, or 8 fathoms is got, and uncertain whether these soundings are on the shoal patch of the eastern bank, or on north-easternmost part of Romania Reef, haul to the south-eastward until in 14 or 15 fathoms; then steer south for two miles (or if False Barbucit bears west), being then to the southward of the shoal patch on the eastern bank, and abreast of the north-eastern extremity of the reef; haul in to the west-south-westward, and get a cast of 10 or 11 fathoms; you may then be certain of these soundings being on the edge of Romania Reef, but in doing so, heave the lead quick; and if less than 10 fathoms, haul directly to the eastward into 16 fathoms; then steer along the south-eastern edge of the reef in 16 or 17 fathoms. If Pedro Branco, when seen, bears S. S. W. you are clear to the eastward of the reef: but if bearing S. b. W. will be on the edge of some of the patches, or close to them. When Pedro Branco bears from S. to E. S. E. do not approach the reef nearer than 16 or 17 fathoms: for it is steep from 16 to 12 fathoms, and from 12 to 3 fathoms at a cast on some of the pyramids, although there is 7, 8, and 9 fathoms, or more, between some of the shoal pyramids, with Pedro Branco bearing as mentioned above. If the weather is very thick, and you are falling to leeward of Pedro Branco, pass into the strait by the channel, between it and Bintang, which is safe and wider than the channel to the northward of the rock; with soundings generally from 15 to 10 fathoms between the Bintang shore and Pedro Branco.

The channel between Pedro Branco and Bintang is of great use; for ships have no cause to anchor, even in thick weather, outside: in case of falling to leeward of the former, they can proceed into the strait by the south channel; and should the tide be setting strong out, and the wind so far to the north-westward that a ship cannot lead far into the strait, it will, consequently, by blowing from the land, afford smooth water for anchorage, until the tide of flood is favourable.

The eastern bank extends from the Bintang shore to the northward, as far as the north-east extremity of Romania Reef. Directly east from Pedro Branco the depths are unequal, 11, 12, and 14 fathoms within a mile of the rock, to 16 and 18 fathoms at 5 or 6 miles east off it, in some places; and 11 or 12 fathoms about 3 leagues in the same direction from it, at about 2 leagues from the north-east part of Bintang, on the eastern bank. E. N. E. to N. E. from Pedro Branco, the depths are generally 13 and 14 fathoms on this bank; and the shoalest patch (already noticed) on the northern part, having 8, 9, and 10 fathoms water; but this patch is very contracted, and bears about E.  $\frac{1}{2}$  N. or E. b. N. from the northernmost patch of Romania Reef, and E.  $\frac{3}{4}$  N. from False Barbucit Hill. The distance from the north-east extremity of the reef, to the shoalest part of the patch on the eastern bank, is from 4 to 5 miles; the soundings from 13 to 17 fathoms, a little irregular. Further to the southward, between the eastern bank and reef, the water deepens to 19, 20, and 22 fathoms, increasing in depth on the near approach to Pedro Branco: the soundings near it, on the north and north-west side, being from 32 to 36 fathoms, and decrease in the north side of the channel to 17 or 16 fathoms, near the south-eastern patches of the reef.

The eastern bank lies nearly on a meridian, or about S. b. E. and N. b. W. In standing from it to the eastward, the depths gradually increase to 20 fathoms, at 2 or 3 leagues distance.

The reef to the eastward of Point Romania appears to consist of shoal patches of rocky ground, with gaps or channels between them; and probably there may be passages to the eastward of the islands, between some of the patches of the reef, with soundings not less than 7, 8, and 9 fathoms in them: but this reef, having never been explored, ships ought not to make too free with it; for the southern verge is very dangerous, the breadth of the channel from Pedro Branco, to where a ship would ground in 18 feet rocks, being not above  $4\frac{1}{2}$  or  $4\frac{3}{4}$  miles.

On the northern patch of Romania Reef the ship Hornby had  $4\frac{1}{2}$  fathoms, about N.  $8^{\circ}$  E from Pedro Branco  $10\frac{1}{2}$  miles.

From Pedro Branco N. b. W.  $\frac{1}{4}$  W. about  $5\frac{1}{4}$  miles, there is a patch with  $3\frac{1}{4}$  fathoms on it.

From Pedro Branco N. N. W.  $\frac{1}{2}$  W. from  $4\frac{1}{2}$  to  $4\frac{3}{4}$  miles, is a patch of 18 feet rocks, very dangerous and steep. In December 1800, steering along the edge of the reef very close, in soundings from 12 to 9 fathoms, and once 7 fathoms, with the wind north-westerly, a strong ebb tide running to the northward, horsed us in upon the reef, among the eddies and discoloured water: had from 11 to 7 fathoms, and several casts of the last mentioned depth, in hauling to the south-eastward to get off.

the reef; but when passing over the outer edge (or wall), which was very conspicuous, from the deep blue water without it, and white discoloured water within, the ship touched the rocks; and taking a considerable careen by the strong tide and fresh wind, grazed over them into deep water, 12 fathoms first cast. When the ship touched, a cast of the lead was not obtained, on account of some ropes in the way; but the former cast was 4 fathoms, having from 7 to 11 fathoms previously, when further in upon the reef. A few cables length to the southward of this dangerous patch, the depth increases to 16 and 17 fathoms. After grazing over it into 12 fathoms, Pedro Branco bore S. S. E.  $\frac{1}{4}$  E. about  $4\frac{1}{2}$  miles; the outermost island off Point Romania W. S. W.  $\frac{1}{4}$  S. the south point of the largest island W. b. S.  $\frac{1}{4}$  S.; the westernmost point of Romania in one with the southernmost hump of the large island. The ship was drawing only 19 feet when she grazed over the pyramid, and there was very little swell.

Pedro Branco is in latitude  $1^{\circ} 20'$  N. about 8 miles east-south-eastward from the centre of Romania Islands, and rather more distant from the nearest part of the Bintang shore. From it Bintang Hill bears S.  $13^{\circ}$  E.; False Barbucit Hill N.  $45^{\circ}$  W.; Northernmost Island off Romania W.  $27^{\circ}$  N.; Largest Island W.  $15^{\circ}$  N.; Barbucit Hill W.  $17\frac{1}{2}^{\circ}$  N.; Point Romania W.  $11^{\circ}$  N.; and Johore Point W.

When Point Romania bears N°. Pedro Branco is visible in clear weather from the quarter-deck of a large ship.

From Pedro Branco, distant about a mile to the south-eastward, is a reef of rocks always above water, having 14 and 15 fathoms close to the east and south-east sides of them. And S.  $17^{\circ}$  W. distant near 2 miles from Pedro Branco, are three rocks, nearly even with the water's edge at high spring tides; but generally above water. Towards these rocks, the depth decreases to 7 and 8 fathoms, sandy bottom when very close: and although near each other, there is 8 and 9 fathoms between them. Passing in through the channel to the southward of Pedro Branco, with the wind from N. and N. W. a ship may keep well up in the weather side of the channel, within one mile or nearer of both the reefs southward of Pedro Branco, to enable her to reach well into the strait, with a scant wind: if the wind is westerly, and the flood tide setting into the strait, it is safe turning, from the two ledges or reefs near Pedro Branco, close over to the Bintang shore.

In case of falling to leeward of this channel, do not go between Bintang and Panjang, the passage between them being rocky and unsafe: but pass outside of Panjang, and when to the southward of it, haul to the westward for the straits of Dryon. There is a safe passage amongst the islands eastward of Dryon.

Near Pedro Branco and the islands off Point Romania, the exact time, and sets of the tides, cannot be directly ascertained, on account of their irregularity. About the full and change of moon, the ebb often sets out strong for 10 or 12 hours in the night; at other times it is irregular and not strong. The tide between Pedro Branco and Romania Reef has more than once been observed to set all round the compass during the night; and at one time N. N. W. 2 miles an hour, direct towards the reef. On spring tides, the velocity of the ebb is from 4 to  $4\frac{1}{2}$  miles an hour, when strongest; the flood not so strong. In neap tides the velocity is 2 or 3 miles an hour, very irregular.

It is high water at Pedro Branco about 11 hours, on full and change of moon, when any irregularity is preserved by the tides.

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## II. REMARKS EXPLANATORY OF THE NAVIGATION OF THE STRAIT OF MALACCA.

PULO JARRA is in latitude  $4^{\circ} 00'$  N. and  $2^{\circ} 06'$  W. from Malacca: the southernmost Sambilang bears from it E.  $5^{\circ}$  N. 22 miles; the soundings in the channel between them 30 and 33 fathoms near Pulo Jarra, and from 24 to 25 fathoms close to the Sambilangs. There are safe channels between some of the Sambilangs, with 20 or 22 fathoms water in them, and a safe passage within them. Working near the Sambilangs in the night, care is requisite to keep clear of a speckled white and black rock, lying about a large mile north-west from the south Sambilang: and from the black rock, situated to the N. N. W. about two miles from the same island.

Round Arroa, in latitude  $2^{\circ} 49'$  N. and 7 miles east from the meridian of the south Sambilang; bearing from it S.  $4^{\circ}$  E.: but, to guard against the westerly currents, a course S.  $20^{\circ}$  E. will not carry a ship too far on the North Sand.

The north-west extremity of the North Sand is in latitude  $3^{\circ} 13'$  N. about 8 or 9 leagues north-north-eastward from the Arroas, where the depths decrease quickly from 28 or 26 fathoms to 10 fathoms or less on the spits of sand, which form the north-west and western parts of the North Bank (or North Sand). There appears to be no danger upon the spits which form the western and north-west extremities of this bank; in standing well over on these parts of the bank, the soundings on the

outer spits were 9 and 10 fathoms; and  $7\frac{1}{2}$  and 8 fathoms on the spits further on the bank to the eastward, with 11, 12, 14, and 15 fathoms in the channels between the spits. When the Round Arroa is in sight from the mast-head, bearing S. S. W. or S. S. W.  $\frac{1}{2}$  W. you are then on the north-west edge of the North Sand, and will pass over spits of 8 and 10 fathoms. The Round Arroa, S. S. W.  $\frac{1}{4}$  W. from the fore-yard  $7\frac{1}{2}$  fathoms. Round Arroa, from the fore-yard, S. W.  $\frac{1}{2}$  S. Parcelar Hill just visible from the poop E. b. S.  $\frac{1}{4}$  S. 7 fathoms hard sand.

It is probable that there is no danger on any of the spits composing the North Sand, to the westward of the  $2\frac{1}{2}$  fathoms Bank's meridian: but, until a survey is made, it will be imprudent for large ships to stand too far to the eastward on the bank; for it is known that there is 5 fathoms (and perhaps less) on some of the spits, about 2 leagues N. b. W. from the  $2\frac{1}{2}$  fathoms Bank.

It is however probable, that with Parcelar Hill E. b. S.  $\frac{1}{2}$  S. or E. S. E. there may be a good passage over the North Sand to the northward of the  $2\frac{1}{2}$  fathoms Bank. There is a passage over it near the Malay shore, bounded by dry sands and breakers on each side, and 5 and 6 fathoms water in it.

With contrary winds from the south-eastward, it is best to work near, and on the western edge of the North Sand, for the advantage of anchoring in shoal water, when stopping tide: ships will also benefit by the tides on the edge of the sand; whereas in the deep water, and near the Arroas, there is frequently a settled current to the north-west and westward.

If the Round Arroa is never entirely sunk from the quarter-deck of a large ship, or an elevation of the eye 16 or 17 feet, she will not be too close to the North Sand; but when sunk from the poop, will be on some of the outer spits, having 7 or 8 fathoms on them.

Mid Channel, between the western part of the North Sand and Long Arroa, the depths is 35 to 45 fathoms, and decreases when near the Arroas. It is safe working near them in the day; the soundings near the Long Arroa and the Black Rock, 2 miles north-east from it, are from 8 to 12 fathoms within a mile of them. Near the flat low Black Rock, bearing about east from the Long Arroa, and north-eastward 4 miles from the Round Arroa, the soundings are irregular from 11 to 20 fathoms; and to the north-east off it is a spot with 6, 7, and 8 fathoms on it. About a mile or more to the westward off this flat Black Rock, there is a sunken rock even with the water's edge; between these the ship Seton passed in 1796, and had soundings from 11 to 17 fathoms.

The Lowajee passed round to the southward of the Arroas, and had various depths, mostly from 8 to 11 fathoms. It is high water about the Arroas, at


six hours full and change of moon ; at these times the ebb runs  $2\frac{1}{2}$  miles per hour, the strength generally N. W.  $\frac{1}{2}$  N. to N. W. b. N. ; the floods very weak.

With a flood tide, or the wind from the northward, keep near the edge of the North Sand, with the Round Arroa in sight from the quarter-deck of a large ship, or from the poop of a small one, in sounding 16 to 20 fathoms. When the Round Arroa bears W. S. W. steer well to the eastward, and sink it from the deck W.  $\frac{1}{4}$  S. ; 14 fathoms will be the least water. When sunk, bring Parcelar Hill to bear east, and draw it to E.  $5^{\circ}$  N. or E.  $6^{\circ}$  N. by the time the low land of Callam is appearing from the deck ; being then abreast of the  $2\frac{1}{2}$  fathoms Bank. In passing this bank, Parcelar Hill E.  $2^{\circ}$  S. just clears it : E.  $3\frac{1}{2}^{\circ}$  S. is upon it. But the hill, any thing to the southward of east, is too close, compasses are so liable to error.

When the Round Arroa is sunk from the deck, and Parcelar Hill E.  $8^{\circ}$  N. you are near shoal water on the edge of the South Sand ; and with the hill E.  $7^{\circ}$  N. will pass over some of the small patches of 5 or 6 fathoms sand, having 16 or 17 fathoms around them. The hill from east, when in the west part of the channel, to E.  $6^{\circ}$  N. when the low land is seen from the deck, are good bearings ; and safe to work with throughout the middle and eastern parts of the channel, if the compass is true.

In leaving the low land, bound to the westward, if Parcelar Hill is clouded, sink the body of Pulo Callam (or piece of land west from the strait) when it bears E. N. E.  $\frac{1}{2}$  N. ; or the east end of the same E. N. E. are good bearings to pass well clear of the  $2\frac{1}{2}$  fathoms Bank : from this bank a spit extends to the southward, on which the depths gradually increase from the bank ; Parcelar Hill E.  $2^{\circ}$  N. you will carry 11 or 12 fathoms over the spit, but the hill E. to E.  $2^{\circ}$  S. may have 7 or 8 fathoms on it. When the tide is strong, eddies prevail on this spit, denoting the  $2\frac{1}{2}$  fathoms Bank to be near, and abreast.

When Parcelar Hill bears E.  $5^{\circ}$  N. and the Round Arroa W.  $1\frac{1}{2}^{\circ}$  S. about one third of the distance from the Arroa towards Parcelar, there is a spot with  $6\frac{1}{2}$  or 6 fathoms least water on it. The Round Arroa, when sunk from the deck, and Parcelar Hill E.  $8^{\circ}$  N. is near the shoal water on the extremities of the South Sand ; and the hill E.  $\frac{1}{4}$  S. when the Arroa is just disappearing, is near, or upon the edge of the North Sand ; the breadth of the channel being here at least seven miles. Between the sands the strength of the ebb sets nearly N. W. but the first and latter parts run very irregular, which renders it dangerous passing the  $2\frac{1}{2}$  fathoms Bank in the night ; except near it before dark, and the situation well known, or the night so clear, that Parcelar Hill is discernible, which sometimes happens.

Parcelar Hill is in latitude  $2^{\circ} 52' N.$  and 45 miles W. from Malacca; it bears from the Round Arroa E.  $4^{\circ} 15' N.$  48 or 49 miles. It is easily distinguished from the other hills, by being situated much nearer the sea, and having a darker shade than the more distant hills: the summit is to the westward of its centre; and when elevated a little above the horizon appears thus:  the highest part is that

generally set, in taking the bearings of the hill. The  $2\frac{1}{2}$  fathoms Bank bears W.  $3^{\circ} 30' N.$  to W.  $4^{\circ} 30' N.$  from Parcelar Hill, distance 7 to 8 leagues; and 13 or 14 miles from the S. W. end of Pulo Callam, about W. b. S.  $\frac{1}{4}$  S. A hill considerably to the northward of Parcelar Hill, and somewhat like it in appearance, generally called False Parcelar, bears from the  $2\frac{1}{2}$  fathoms Bank N.  $45^{\circ} 30' E.$

On high spring tides, the perpendicular rise and fall is from 14 to 15 feet, on the North Sand; and from Pulo Callam to Cape Rachado.

When passed the  $2\frac{1}{2}$  fathoms Bank, the trees to the south-east of Parcelar will generally be visible from the deck; and the depth of water increases in standing to the eastward for the hill. If it is night, deepen to no more than 26 or 27 fathoms towards the South Sand. In the day, if Pulo Callam is kept plainly in sight from the deck, it is thought a ship will not be too close to the South Sand.

The shore about Parcelar Hill should not be approached nearer than 17 fathoms; this depth being near the edge of the bank, which extends to seaward along the concavity of the land, abreast of Parcelar Hill, and is very steep on the outer edge. Do not come within a straight line joining the two extremes of the land, in passing the Bight of Parcelar: or do not bring the southernmost extreme (Parcelar Point) to the southward of S.  $60^{\circ} E.$  to keep clear off the Shoal Bank, embracing the Bight westward of Parcelar Point: 17 fathoms are the soundings at a considerable distance without it, in some places; also, close to the outer edge is 16 and 17 fathoms, from whence it shoalens quick to 3 and  $2\frac{1}{2}$  fathoms, hardish black sand. It must however be observed, that abreast of Parcelar Hill, about 3 or 4 miles without the outer verge of the Shore Bank, there is a narrow bank in the channel, extending in a line parallel to the coast, for a considerable distance to the south-eastward; with soundings 13, 14, and 15 fathoms on it, which may be mistaken in the night for the Shore Bank, by persons unacquainted: the soundings within the Middle (or Channel) Bank, are mostly 19 or 20 fathoms near it; shoaling to 17 fathoms towards the edge of the Shore Bank; but not always regular, for 20 and 21 fathoms is near the edge of the Shore Bank, about Parcelar Point.

Towards the north parts of the South Sand, abreast of Callam and Parcelar Hill,

the depth of water is not so great as towards the eastern part of the sand, with the hill from N.  $\frac{1}{4}$  W. to N. b. W.  $\frac{1}{4}$  W.: here it deepens from 32 to 46 fathoms irregular, towards the South Sand; the deep water, denoting the approach to the sand in this part, is of great utility in the night; for the channel between the South Sand pyramids, and the shoals in the Bight of Cape Rachado, is more contracted in this part than to the northward of Parcelar Point.

In passing from Parcelar Hill to Cape Rachado, to avoid the shoal soundings of the main, pass Parcelar Point at 3 or 4 miles distance; and when the cape is seen, keep it to the eastward of S.  $60^{\circ}$  E. and do not bring Parcelar Point (the north extreme) to the westward of N.  $43^{\circ}$  W. in passing the bight (or bay) from the point, to Cape Rachado: for these bearings will not lead a ship far without the shoals in the bight.

Cape Rachado, E. S. E. is a fair mid-channel bearing throughout.

Abreast of Parcelar Point in the night, steer S. E. b. E. to pass Cape Rachado, which is the course from point to point; the distance between them 24 or 25 miles: if the soundings are 25 to 27 fathoms you will be in the fair track: if 35 to 40 fathoms, towards the South Sand; and if under 17 or 18 fathoms, in passing the shoals in the bight, will be much nearer them than the South Sand. As a general remark, this may be of use; but, it must be observed, that the soundings are often irregular in the channel from Parcelar Point to Cape Rachado, there being 30 fathoms within 2 miles of the shore bank to the southward of Parcelar Point: and some small banks in the channel, with 11 to 15 fathoms on them, although these are few, and generally in the shore side of the channel. But take care not to deepen above 36 or 38 fathoms towards the pyramidal spots, with  $1\frac{1}{2}$  and 2 fathoms water on them, which compose the eastern boundary of the South Sand, and bear from S.  $\frac{1}{4}$  E. to S. b. E.  $\frac{1}{4}$  E. from Parcelar Hill; and W.  $\frac{1}{4}$  N. to W. b. N. from Cape Rachado: there is deep water to the N. E. off these shoal spots, from which it decreases quick in standing near them, from 40 or 46 fathoms to 30, 20, 10, and 2 fathoms.

When Cape Rachado bears N. E. there is no danger supposed to be on the South Sand; the strait, when a little past the cape, being thought safe from side to side, excepting a bank about 6 leagues to the south-westward of the Water Islands, on which the Milford grounded. But, in general, ships do not stand over near the Sumatra shore, between Cape Rachado and the Water Islands.

The tides set fair through the channel from Parcelar Hill to Cape Rachado; and in the springs, run strong with eddies, particularly when near the Cape.

From Cape Rachado to Fisher's Island, there is 17 and 18 fathoms not far from



the shore, in some places: about half way between them there is a large rock always above water, about  $1\frac{1}{2}$  or 2 miles from the shore, having 17, 18, and 19 fathoms irregular soundings very near it; and hereabout are several straggling rocks under water, lying  $1\frac{1}{2}$  or 2 miles from the shore, with 10, 11, and 12 fathoms water between some of them, which renders it imprudent to approach too close to the shore in the night.

Tanjong Clin, about 5 miles to the north-westward of Fisher's Island, is known by two or three trees on the point, more elevated than the others near the sea. Passing Fisher's Island, 14 and 15 fathoms is near the foul ground which surrounds it, to more than half a mile's distance; and is steep to the south-west from 14 to 12, 7, 5, and 3 fathoms rocky bottom. It has been asserted recently, that there is a small bank with only  $3\frac{1}{2}$  fathoms on it, bearing S. S. W. from Fisher's Island 2 miles: if it exists, it is remarkable, as this situation is in the fair track of ships working into the road.

In Malacca Road the anchorage is best when under 10 fathoms; the church on the hill N. E. b. E.; Fisher's Island N. W.  $\frac{1}{2}$  W.; the tuft of trees E. From 4 to 10 fathoms the bottom is soft mud, and continues so close to the shore; but when the depth is more than 10 fathoms, it is generally stiff clay, requiring good cables to purchase the anchors, when once fixed in this stiff bottom. To boats or vessels (without copper sheathed) the worms are very pernicious in this road.

In coming from the southward for Malacca Road in the night, when round the Water Islands, do not haul in too close to the shore, until nearly abreast of Malacca; for the shore is lined with a rocky flat called Panjang Reef, extending about 2 miles from the shore, having 18 and 19 fathoms within two cables lengths of it, and 15 fathoms close to the rocks. Malacca church bears from the west end of Panjang Reef N.  $\frac{1}{2}$  E. and from its east end N.  $25^{\circ}$  W. distant from  $1\frac{1}{2}$  to  $3\frac{1}{2}$  miles. The ships Cartier and Asia, from China, working in towards the road in the night, got upon this dangerous rocky reef. The Shah Byramgore escaped grounding, by anchoring close to the rocks; also in the night, returning from China.

There is 17 fathoms close to the outer Water Island. Within this, and also within the westernmost, is a channel of 18 and 19 fathoms water. Also between the Large (or Inner) Island and the others, the soundings are 18 and 19 fathoms, excepting a rock or reef under water, situated nearly in mid-channel. From 8 feet on it at low water, the west end of the large Water Island bore N.  $28^{\circ}$  W. and Malacca church open to the westward of it  $1^{\circ} 29' 30''$  by Sextant; the north-east end of the Large

Island N.  $\frac{1}{2}$  W. ; the westernmost Water Island W. S. W. ; and the Small Island or point to the eastward of the southernmost Water Island, just appearing over the rocky point of the east end of Middle Island, bearing then S.  $\frac{1}{2}$  E.

These bearings are extracted from the account of Captain J. Lindsay, who discovered this rock ; and to whose industry navigators are so much indebted. He infers, that the rock in this channel may be avoided, by either keeping the Middle Island on board, or the Large Island : the rock is about one mile from the former, and nearly the same distance from the south-east end of the latter. Vessels from the eastward, to pass through this channel, may keep the south end of the Large Water Island N. W. or more westerly, till they shut in the southernmost Water Island with the two others ; or may steer for the northernmost of the Four Brothers (or Outer Islands), and pass it on the north side at half a mile distance ; not bringing the westernmost Island (or Brother) to the southward of W. S. W.  $\frac{1}{2}$  S. until past the Middle Island, which may be approached within 100 yards without danger.

In Malacca Road, the squalls from the Sumatra side are frequent in the south-west monsoon ; and sometimes sudden hard squalls happen in the night, with much thunder, lightning, and rain. Several ships have been struck by lightning, lately, in this road. The tides of flood and ebb continue to run through the road, two hours after it is high and low water on the ground.

The Oriental Pilot says, "*Steer from the Water Island S. E. to raise Pulo Pisang.*" By steering this course in the night, a ship will get upon, or to the southward of, the Long Middle Bank ; on the north-west end of which, is 5,  $4\frac{1}{2}$ , and 4 fathoms. At anchor, in  $4\frac{1}{2}$  fathoms, in 1789, the boat at a small distance had a small quarterless 4 fathoms, Mount Formosa bearing N. b. E.  $\frac{1}{4}$  E. : this probably is the least water on the Long Middle Bank, which is not esteemed dangerous, the bottom being mostly mud, except in some places mud and sand, on the north-west part.

From the Outer Water Island Pulo Pisang bears E.  $32^{\circ}$  S. 66 or 67 miles. And being abreast of the Outer Water Island, from 1 to 3 or 4 miles distance, a course S. E. b. E. will carry a ship at the same distance without the bank, lying off Formosa River, if not affected by lateral tides. On the Formosa Bank, when aground in  $2\frac{1}{2}$  fathoms at low water, the Asia had Formosa Peak N. E. b. E.  $\frac{1}{2}$  E. ; entrance of Formosa River N. E.  $\frac{1}{4}$  E. ; Mount Mora N. W. b. N. ; western extreme N. W. b. W. distance from the river 5 or 6 miles.

The Long Middle Bank commences S. S. W. from Mount Formosa. Keep Pulo Pisang E. b. S.  $\frac{1}{2}$  S. or E. b. S.  $\frac{3}{4}$  S. until Mount Formosa is brought N. b. W. to pass within it. Pulo Pisang, when seen E. S. E. or E. S. E.  $\frac{1}{4}$  S. is a fair bearing, to pass mid-channel between the Long Middle Bank and the shore. If a ship

gets to the southward of the Long Middle Bank, there is a safe channel between it and the Sumatra Bank, with 17, 18, and 19 fathoms mid channel; shoaling quick on the edges of each bank, when standing to them in turning, and when advancing so far as to have Pulo Pisang bearing about N. E. b. E. may cross over the Long Middle Bank in 6 and 7 fathoms, to regain the proper channel. It is thought that the soundings on the Long Middle Bank are 4 and 5 fathoms, on the shoalest parts of its north-west end; 5 and 6 fathoms on the middle part; and  $6\frac{1}{2}$  to 8 fathoms on its south-eastern extremity, towards the Carimons.

Pulo Pisang, in latitude  $1^{\circ} 28'$  N. and 61 miles E. from meridian of Malacca; is steep to on the west side; but a spit is situated to the south-east off it. The Gunjaver, in 3 fathoms, had the outermost island off Pisang, N. W.  $\frac{1}{4}$  W. and the innermost island N. N. W.  $\frac{1}{4}$  W. distant 2 or 3 miles from Pulo Pisang.

From this island, towards the Carimons, the soundings are mostly from 16 to 18 fathoms in the channel. When the North Brother is on with the north end of the Little Carimon, or nearly so, the depth decreases suddenly on the south-east end of the Long Middle Bank; and the bank that bounds the channel on the shore side, from Pulo Pisang to Pulo Cocob, is steep under 12 fathoms, this depth being near it.

On the bank which extends in the line of the fair channel, between Mount Formosa and Pulo Pisang, the general depth is from 8 to 11 fathoms; the least water on this fair channel bank appears to be  $6\frac{1}{2}$  or 7 fathoms in two places; when Pulo Pisang bears N. E. b. N. and E. b. N. from 4 to 5 miles.

In turning from the Water Islands, until past Mount Mora, the strait is safe from side to side, and may be approached to 12 or 14 fathoms in the day. On the edge of Formosa Bank, the depth decreases quick; but the lead will give warning to tack in time if kept briskly going; there is 12 and 15 fathoms water between this bank and the shore. From Mount Formosa to Pisang, likewise from Pulo Pisang to Pulo Cocob, the mud bank extends from the shore to a considerable distance; and it may be observed, as a general rule, that the depth of water decreases quick on the edges of the shore banks throughout the strait, and on those situated at a distance from the shore; also on the verges of the banks in the middle of the strait.

The Little Carimon and Brothers are bold to stand near to, and Pulo Cocob may be approached to a reasonable distance on the south-west side. This island bears S. E. b. E. from Pulo Pisang from 5 to 6 leagues.

The mud bank off Pulo Cocob entrance, and around Tanjong Boulus, extends about  $1\frac{1}{2}$  miles from the shore, having 15 and 17 fathoms close to the edge of it in

some places, where a ship would ground. In the opposite sides of the channel, near the Little Carimon, the depths are 20 to 22 fathoms; and generally 17 and 18 fathoms in mid channel, continuing the same towards the edge of the bank, contiguous to Tanjong Boulus. From abreast of this point to the Coney the course is about E. S. E. but must depend greatly on the direction of the wind and tide; the latter being very irregular between Tanjong Boulus and the Coney, caused by the numerous islands, and the meeting of the tides. The flood from the northward continues through the strait to the Carimons, and meets the flood tide from the China Sea (by Sincapour Strait) about Tree Island, causing a division of tides in this place. About Tree Island, and near it, the tide sets sometimes fair through the channel; at other times directly across it, from the straits of Dryon to the west entrance of the old Strait of Sincapour and opposite.

Tree Island is a bank of rocks and sand, a little above water, with two small trees or bushes on it, separated from each other. A reef extends to a considerable distance from the west and northwest parts of the bank, on the extremities of which a ship will shoal on, when passing near; 13 or 14 fathoms on this spit is close enough to the north-west part of Tree Island. In the day, when clear, the north peak of Great Carimon, on with the south point of Little Carimon, is a fair mark for passing Tree Island. But in dark weather, or in the night, when clear, Barn Island is the best guide.

The south end of Barn Island, E. b. S. is a mid channel bearing in passing Tree Island. With a working wind, do not near the shoal on the north side of the channel more than to bring the south end of Barn Island E. S. E.; or approach Tree Island nearer, than to have the same bearing E. 5° S. Abreast of the north-east point of Tree Island, when the south end of Barn Island bore E. 3° S. had 13 and 14 fathoms water, being near it; but it should not be brought to the eastward of E. 5° S. or E. 4° S. when abreast of the north-west end of Tree Island. The soundings between Tree Island and Barn Island are mostly from 12 to 7 fathoms; but there are between them in the fair channel some small banks of 7, 8, and 9 fathoms, fit for anchorage; and the anchorage is good on the west side of Barn Island, out of the stream. Throughout Malacca Strait, in the channels, and on the edges of the banks which extends along the Malay shore, the bottom is generally soft and fit for anchorage.

Near Tree Island, on the south-east side, the soundings are 5 and 6 fathoms; and it is thought there is a channel between it and Red Island of 7 and 8 fathoms. The Middleburgh Shoal lies to the south-west off Tree Island; the rocks on it are even with the water's edge. This shoal when on with Red Island, bears N. 77° E.

and when on with the peak of Little Carimon, bears N.  $35^{\circ}$  W. There is said to be another reef, bearing about E. S. E.  $\frac{1}{2}$  S. from the north end of the Little Carimon, about 6 miles from the Carimons, and is in one with Barn Island, E.  $19^{\circ}$  N.

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### III. REMARKS FOR SINCAPOUR STRAIT.

THE channel leading into the western part of this strait is formed by Tree Island and Red Island to the southward; and Barn Island, with the two islets off its south point, called the Rabbit and Coney, to the northward. These two islets are joined to Barn Island by a reef of rocks, partly dry at low water; the smallest called the Coney is outermost, of a round form, and bears from the tree on Tree Island (or bank) E.  $9^{\circ}$  N. distant about 5 miles; and from Red Island N.  $46^{\circ}$  E. 4 miles. Ships keep near the Coney in passing; the soundings 20 to 24 fathoms within two cable's lengths; and in working, do not stand far over towards the south shore; the bottom being rocky, and deep water on that side, renders it improper for anchorage. There is also a reef of rocks covered, except near low water; situated south-eastward from the Coney, about  $3\frac{1}{4}$  or 4 miles distant.

From the Coney the south point of St. John's (or small islets appearing as part of St. John's) bear E.  $25^{\circ}$  N. 11 or  $11\frac{1}{2}$  miles. A straight course or direct line joining them is a fair track, along the north side of the channel; where there is mostly soundings from 18 to 30 fathoms, the bottom sand and gravel, or rotten rock, affording anchorage if necessary. But towards the south shore the depth is great, and the bottom rocky; therefore avoided by ships in passing.

The Buffalo Rock bears E. or E.  $1^{\circ}$  N.  $6\frac{1}{4}$  or  $6\frac{1}{2}$  miles from the Coney; and S.  $34^{\circ}$  W. from the south point of St. John's, about  $5\frac{1}{2}$  miles. It is a black rock always seen above water, with 45 to 60 fathoms close to it; situated about mid channel between the south shore, and the island between the Coney and St. John's on the north side of the channel, generally called Middle Island. From this island to the Buffalo Rock, is the narrowest part of the channel; for the south-east part of this island has a long prong or spit projecting from it, to a considerable distance under water, and a reef of rocks about a mile to the E. S. Eastward of this island, always covered, except at very low tides; some points of rocks are then, just per-

ceived even with the surface of the water. In turning here, short tacks are proper to preserve the fair channel; the south point of St. John's E. N. E.  $\frac{1}{2}$  N. carries a ship not far to the southward of the reef, to the south-eastward of Middle Island, and should not be brought more easterly, when in this part of the strait.

Between the Coney and St. John's, the tide in the channel sets fair through; and often very strong with eddies. When strongest, it runs about  $4\frac{1}{4}$  or  $4\frac{1}{2}$  miles an hour, which makes it unpleasant anchoring here in the night, particularly with large ships, and the weather unsettled, if unacquainted. But frequently the tide runs moderately, and the weather favourable. At these times a ship may conveniently anchor, if it falls calm, or obliged to stop tide, in any part of the northern side of the channel; but the best anchorage is upon a bank, about half way between the Coney and St. John's, southward from Middle Island, with soundings on it from 15 to 18 fathoms rotten rock.

If unacquainted, and the night not clear, it would be imprudent to enter the channel between the Coney and St. John's. But in settled weather, if acquainted, there appears no danger in passing through with the tide, even with a contrary wind, in a handy middle-sized ship, by attending to the following remarks.

If the night is not very dark, either Barn Island or St. John's will be visible; and when midway between them, both at the same time. Use the south end of either of these islands as a leading mark, whichever is most conspicuous. The south end of Barn Island W.  $\frac{1}{4}$  S. to W. b. S.  $\frac{1}{4}$  S. are good working bearings. Or the south end of St. John's N. E. to E. N. E.  $\frac{1}{2}$  N. when near it; but from N. E. b. E. to E. N. E.  $\frac{1}{2}$  N. when nearest Barn Island. The narrowest part of the channel is when the Buffalo Rock bears from S. b. E. to south, between it and the reef E. S. Eastward from Middle Island, and to know when in this part of the channel in the night, Middle Island will in general be perceived to appear nearer than the other islands, on the north side of the channel. Observe, when approaching the meridian of the Buffalo Rock, that it bears from the centre of middle S.  $23^{\circ}$  E. Therefore, when Middle Island bears about N. N. W. keep the south end of St. John's from E. N. E.  $\frac{1}{2}$  N. to E. N. E.  $\frac{1}{4}$  N. or the south end of Barn Island W. b. S.  $\frac{1}{4}$  S. is a good bearing, until about two miles to the eastward of Middle Island; being then past the reef on the north side of the channel, and well to the eastward of the Buffalo Rock, may steer direct for the south point of St. John's; or with a contrary wind, make short tacks to pass it at a small distance.

In the channel between St. John's and the Coney, if a ship is at anchor in the night, stopping tide, or otherwise; and the weather becomes squally, so as to make her sheer about, and part the cable; it will be best not to let go another anchor,

deeper towards Pedro Branco than near the shore of Bintang: and borrowing towards the Bintang Shore, is more prudent in the night.

If the summit of Bintang Hill is visible over the low land, run out to the eastward until it bears south, which will place a ship two or three miles to the eastward of Pedro Branco's meridian: she may then steer to the northward, if certain of a strong tide running out of the strait; or rather north-eastward for some time, if the direction of the tide is not known, until well to the eastward of Pedro Branco and Romania Reef; taking particular care, if the wind is light, and flood-tide running into the strait, to counteract it by the course, and prevent being drifted near Pedro Branco.

In proceeding out, or inward, by this channel, if it falls calm, or the tide and wind unfavourable, and therefore necessary to anchor, it may be accomplished conveniently throughout the channel, the bottom consisting mostly of sand and gravel: and the depth of water between Pedro Branco and the Bintang Shore, generally from 10 to 17 fathoms; but deeper to the south-west of Pedro Branco, than to the southward and south-eastward of it. The shoalest water is towards the Bintang Shore, and probably the depth decreases rapidly under 10 fathoms, when near the shore.



#### IV. GENERAL REMARKS ON THE WINDS AND CURRENTS IN MALACCA STRAIT.

It may be observed, as a general remark, that in Malacca Strait, where the tides do not prevail, the current sets much oftener to the northward than to the southward. And from the Arroas to Junkseylon and Pulo Rondo, the current most frequently sets to the northward in both monsoons, except amongst the islands along the Malay shore, where regular tides are prevalent.

Near the entrance of the strait, between Achen Head and the Nicobar Islands, the current, at times, sets contrary to the monsoon: in the south-west monsoon to the southward; and in November, December, and January, often sets to the northward. From the coast of Pedier to Pulo Bouton and Junkseylon, the general current is to the northward all the year round.

Between the Nicobar Islands and Pulo Bouton, frequently strong rippings are

seen, which may be alarming to strangers in the night, from the noise occasioned by the broken water. These rippings extend in long narrow ridges, with smooth spaces between them; and the agitation of the water produces so high breakers at times, on some of the ridges, as to render it dangerous to risk a boat amongst them. They move with considerable velocity, which is thought to indicate a strong current; but it appears from experience, that often, when these strong rippings prevail, there is no perceptible current.

Various are the opinions relative to entering the strait from the westward, in the south-west monsoon: some experienced commanders prefer the track from Pulo Rondo, along the coast of Sumatra, to Pulo Varela, and from thence to the Arroas; while others prefer to pass near the Nicobars, then steering to make Pulo Bouton, bearing E. S. E. and continue along the Malay side of the strait, for several leagues past the Sambilangs.

It appears difficult to assert positively, which of these tracks is most advantageous. But it is generally allowed, that it is prudent to keep near the land when convenient, and avoid the middle of the strait, especially about Pulo Pera, where more calms prevail in the south-west monsoon than near either shore. Both early and late in the season, quick passages have been made from Pulo Rondo, along the coast of Sumatra, to the Arroas: notwithstanding, the Malay side of the strait is generally used, and probably is the preferable track.

Pulo Rondo is in latitude  $6^{\circ} 05' N.$  and is  $6^{\circ} 59' W.$  from Malacca: and Pulo Pera in  $5^{\circ} 42' N.$  and  $3^{\circ} 10' W.$  from Malacca. The longitude of Malacca is  $102^{\circ} 15' E.$  by mean of eight persons.

From Pulo Rondo, proceeding by the coast of Sumatra in the south-west monsoon, a ship will be much liable to calms, unless she keeps near the shore; the regular sea-breezes on the coast of Pedir extending not further than a few miles from the shore. In July, on that coast, at the distance of 7 and 8 leagues from the shore, we experienced for several days calms and faint airs, with a westerly current, one mile an hour, preventing any progress being made to the eastward. The current, mostly inclining to the westward, and the chance of calms under the high land, from Achen Head along the Pedir coast, inclines the greater number of English ships to avoid this coast, and steer for the Malay side of the strait.

From the Nicobar, by steering to the east-north-eastward, and afterwards to the eastward for Pulo Bouton, making a small curve with the convex side towards Junk-seylon, strong south-west and westerly winds have been sometimes carried up to Prince of Wales's Island. Thus, by steering far from Achen Head, the monsoon wind will generally be retained, until well to the eastward; and calms avoided.



which prevail near the islands off Achen. There are, however, often light winds and calms, from the coast of Pedir the whole way across to Pulo Bouton and Junk-seylon, in this monsoon.

From Prince of Wales's Island to the Sambilangs, tides prevail near the shore, which is lined by a bank of mud extending out to a considerable distance, from the former island to Pulo Dinding. From 15 or 16 fathoms, the water shoals suddenly on the edge of this bank, which requires to have the lead quick in standing on the edge of it, if a ship is going fast through the water; but may stand into 9 or 10 fathoms, when requisite. Ships coming to the northward, bound to Prince of Wales's Island in the north-east monsoon, ought to keep near the shore bank, after passing Dinding; for by stretching far out, into the middle of the strait, they are liable to meet strong north-east winds, when near Prince of Wales's Island, which may delay them in reaching the harbour.

During the north-east monsoon, there are seldom any hard squalls in Malacca Strait; and generally the wind blows from the Malay Shore in the night, particularly when near this side of the strait: and the weather is settled, with less thunder and lightning, than during the other monsoon.

The north-westers, or squalls, from that quarter, and also the Sumatras, or south-west squalls, are frequent in the south-west monsoon. At the first approach, they sometimes blow strong, but are generally of short duration. A cloudy arch, rising from the horizon, mostly preceeds these squalls, and gives sufficient warning of their approach: although sometimes, the interval from the first appearance of the cloud above the horizon, until it reaches the zenith, is not more than a sufficient length of time to reduce sail; at other times their approach is slow.

From Parcelar Hill to the Carimons, the Sumatras are more frequent than the north-west squalls, and continue a considerable time, either a strong or moderate gale, with much thunder, lightning, and rain, at times; particularly near Malacca. The prevailing winds from the Carimons to Pedro Branco, in this monsoon, are southerly.

Malacca Strait, to persons unacquainted, appears an intricate navigation; but it is certainly not very dangerous, as most of the channels are spacious, with good anchorage throughout. Ships formerly kept boats ahead, sounding in the day, and anchored during the night in most places of the strait. At present ships, who frequent this navigation, keep under way, mostly day and night, often passing through without anchoring above one or two times. To those acquainted, or even to strangers following explicit directions, there is probably little hazard in keeping under way in any part of these straits, in the night, except passing the 2½ fathoms Bank, between

the Arroas and Parcelar Hill; passing Tree Island in coming from the northward, and from thence to St. John's, if not very clear; and going out between Pedro Branco and Romania Reef in the night.

Ships which sail well, will gain ground with a turning wind, against the tide or current, in most places of the strait, in neap tides; especially if advantage is taken of the small shifts of wind, and a moderate working breeze. From the Arroas to Mount Mora, the tide is stronger than in other parts: in this space, if the wind is right against a ship, she may find it impossible, at times, to gain ground, even against neap tides.

By running in the night, it facilitates much the passage through the straits; for often steady breezes prevail during the absence of the sun; when calms and faint airs predominate in the day.

If at anchor when calm, or otherwise, a cloud begins to rise, indicating a north-wester, the anchor should be instantly weighed, when bound to the southward, before the squall reaches the ship: for the first part of these squalls, being generally brisk, will prevent her from purchasing the anchor, until the force of it is abated; which will considerably frustrate the benefit that would have been obtained, had the anchor been weighed before the squall reached the ship, exclusive of the chance of parting the cable, unless a good one, or the anchor light, allowing the vessel to drive.

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#### V. DESCRIPTION OF BANKS IN THE STRAIT.

THERE is a bank about W. S. W. 4 or 5 miles from Little Dinding; the shoalest water on it is probably about 6 fathoms.

There is said to be a bank W. N. W. from Cape Caran, distant about 5 or 6 miles, having soundings on it  $3\frac{1}{2}$  fathoms, broken shells.

About N. W. b. N. 3 leagues from Pulo Varela, there is said to be a bank of 2 fathoms. If a bank exists in this situation, probably 7 or 8 fathoms is the least water on it.

From Pulo Varela, about W. b. S. distant from the Sumatra shore 5 miles, a bank of  $1\frac{1}{2}$  fathoms is said to exist, but doubtful.

About 7 leagues W. b. N. from the Long Arroa, and 6 leagues from the Sumatra shore, there is said to be a bank even with the water's edge: this is very doubtful.

About 9 leagues north from the Long Arroa, a small bank is thought to be situated; least water on it 13 and 14 fathoms.

The North Sand, and  $2\frac{1}{2}$  fathoms Bank, situated on the southern verge of it, have been described in the Explanatory Remarks. His Majesty's frigate *La Virginie*, *Shah Muncher*, and several other ships, have grounded on the  $2\frac{1}{2}$  fathoms Bank. His Majesty's ship *Victor*'s examination of it, in January 1805, makes it nearly  $1\frac{1}{2}$  miles in length from N. N. W. to S. S. E.; and 1 mile in extent from E. N. E. to W. S. W. bearing from Parcelar Hill W.  $4^{\circ} 30'$  N.; the low land just seen above the horizon with an elevation of the eye 16 feet. It appears very hard, the lead frequently slipping into holes, as from off a rock, but brought up only fine white sand. Around the bank, from 4 and 5 fathoms, the depth increases to 10 and 11 fathoms, mostly hard ground. On the small bank, 3 or 4 miles north-eastward from the flat black rock, situated near the Round Arroa, the least water is thought to be  $5\frac{1}{2}$  or 6 fathoms.

East southerly, from the Round Arroa  $4\frac{1}{2}$  leagues, is a small bank, on which the *Gunjaver* found the least water  $4\frac{1}{2}$  fathoms sand.

East from the Round Arroa, 16 or 17 miles, there is a small round bank: sounding all over it, we had no less than 5 and  $5\frac{1}{2}$  fathoms hard sand, at low spring tides; the boats deepening fast in every direction, at half a cable's length from the ship at anchor. About 3 or 4 miles east by south to east-south-eastward from this patch, there are shoal spots of 7 and 8 fathoms: from these shoal patches, on the south side of the channel, between the Arroas and Parcelar, the Round Arroa bears from W. to W.  $3^{\circ}$  N. and Parcelar Hill E.  $5^{\circ}$  N. to E.  $7^{\circ}$  N.; and they are much nearer the Arroa than the low land of Parcelar. There is probably no less water on any of these patches than  $4\frac{1}{2}$  or 5 fathoms; but, to avoid them, do not bring the Round Arroa to the westward of W.  $\frac{1}{4}$  S. or W. a large quarter S. while it can be seen from the poop of a lofty ship.

The South Sand, so called, appears to be very little known: it is probable, that it has no resemblance to a continued sand, but formed of small banks, similar to the foregoing, which may be the prominent patches of the sand to the north-west. A little further eastward from the Round Arroa than these patches, the *Sarah*, Captain C. C. McIntosh, running across in the night, shoaled suddenly to  $8\frac{1}{2}$  fathoms and anchored; having seen the Round Arroa from the mizen shrouds before dark, bearing S. b. W.  $\frac{1}{4}$  W. and at day-light found Parcelar Hill bearing E.  $15^{\circ}$  N. Weighed, the wind S. S. E. and steered N. W. and N. W. b. W. in soundings  $9\frac{1}{2}$ , 9, 8, 9, 8,

$8\frac{1}{2}$ , 8,  $8\frac{1}{2}$ , 9,  $8\frac{1}{2}$ ,  $7\frac{1}{2}$ , 7,  $6\frac{1}{2}$  fathoms; Parcelar Hill then E.  $11^{\circ} 30'$  N. 9,  $8\frac{1}{2}$ , 10, 14 fathoms; then steer N. N. E. and N. E. b. N. in 10,  $8\frac{1}{2}$ , 14, to 20 fathoms, the Hill then E.  $9^{\circ}$  N.; from thence steer towards Parcelar, and had no less than 20 fathoms, with the Hill E.  $7^{\circ}$  N. These soundings must have been on the South Sand, and from the bearing of Parcelar Hill at day-light, E.  $15^{\circ}$  N. seems to evince that the northern part of the South Sand is not so dangerous as generally supposed; or at a greater distance from the southern extremity of the North Sand.

South-west from Parcelar Hill, about 6 leagues, and about 5 leagues from the nearest part of the land, his Majesty's ship Albion anchored in 6 fathoms, in 1804, on one of the outer patches forming the South Sand, which is probably the nearest to the land in this part.

The easternmost verge of this bank appears the most dangerous, bearing S. b. E. to S. b. W. from Parcelar Point, opposite to the bight between this point and Cape Rachado. The nearest of the patches are distant from the nearest land about Parcelar Point  $10\frac{1}{2}$  or 11 miles; they consist of small pyramids of hard sand, with  $1\frac{1}{2}$  and 2 fathoms water over them. The Hornby had Parcelar Hill N. b. W. and Cape Rachado like an island E.  $\frac{1}{2}$  S. when the boat, at two cables lengths distant, was in  $1\frac{1}{2}$  fathoms on one of these spots. The Lord Macartney, aground on one of them, had Parcelar Hill N.  $12^{\circ}$  W. and Cape Rachado E.  $8^{\circ}$  S.; this ship was nearly lost, being obliged to lighten before she got off the sand. The Besborough, aground, had the Hill N.  $\frac{1}{2}$  W. and Cape Rachado E.  $\frac{1}{2}$  S.; the Lascelles, in company, at anchor in 8 fathoms, S. b. W. about half a mile from the Besborough, aground, had Parcelar Hill N.  $\frac{1}{4}$  W. and Cape Rachado E.  $\frac{1}{2}$  S. about 6 leagues. When the Besborough floated, they steered from E. S. E. to S. S. E. in irregular soundings, from 8 to 17 fathoms, hard ground. The ship Indus, was also nearly lost on one of the sandy pyramids, in this dangerous part of the South Sand. To the southward of the South Sand, from the Arroas to abreast of Malacca, the Sumatra side of the strait is very little known. Probably the channel along this shore, may be as safe as that of general use to the northward of the South Sand, if the former were explored. Recently a Danish vessel, unacquainted, passed along the Sumatra side of the strait, until to the southward of the South Sand; then crossed over to Malacca, and is said to have experienced no indication of danger.

The land from the point, forming the east side of False Callam Strait, declines towards Parcelar Hill, and then takes a south-easterly direction to Parcelar Point, by which a bight is formed between the Points; and a shoal bank, stretching from Point to Point, occupies this bight off Parcelar Hill. With the wind at N. E. standing in towards the Hill, had 17 fathoms several casts, with the large lead kept going,

next cast 5 fathoms; the helm then put down, grounded in the stays at high water, being then a medium between neap and spring tides: had 12 feet at low water and 18 at high water, in the night, and on the following day had 21 feet before high water, when we floated. This was in June 1803, the tide apparently ebbing and flowing very little at this time in the night, being the south-west monsoon; but the principal tide happening in the day. In these straits, during the opposite monsoon, when the sun is to the southward of the equator, the principal, or highest tide, appears to be in the night: the same phenomenon is experienced on the coast of Concan, at Bombay, and other places. When aground, the centre of Parcelar Hill bore N.  $31^{\circ}$  E.; northern extreme of the land N.  $51^{\circ}$  W.; and the southern extreme Parcelar Point S.  $49^{\circ}$  E. off shore about  $2\frac{1}{2}$  miles.

This bank, in the bight off Parcelar Hill, is composed of fine hard black sand, like steel filings; and has 17 fathoms very near the edge of it in some places. The Mysore grounded on it in 1802, and was with some difficulty hove off. With Parcelar Hill N.  $\frac{1}{4}$  W. the Gunjaver's helm was put down in 11 fathoms, and grounded on it in the stays. The Hampshire, a Macao Portuguese ship, and several others, have grounded on this bank, to the northward of Parcelar Point. In the channel, abreast of Parcelar Hill, is a narrow bank, 3 or 4 miles without the verge of the shore bank, with 13 and 14 fathoms on it, which has been already mentioned in the Explanatory Remarks.

To the south-eastward from Parcelar Point, some shoal patches exist; the southernmost is about half way between it and Cape Rachado; and the northernmost, near Parcelar Point, is thought to have 20 and 22 fathoms near the outer edge. Some of the others, near the middle of this bight, appears to have regular soundings on their outer edges, from 12 to 8 or 9 fathoms; but, in general, the soundings are not a safe guide in standing near the edges of the banks, to the south-eastward of Parcelar Point. When more than half distance from the point towards Cape Rachado, or within 3 or  $3\frac{1}{2}$  leagues of the Cape, you are then past to the southward of all the dangers in this extensive bight; between which, and the shoal pyramids of the South Sand abreast, is the narrowest part of the channel hereabout.

On one of the northernmost patches in the bight, southward from Parcelar Point, the Sarah, aground, had Parcelar Hill N.  $30^{\circ}$  W. the depth on one side of the ship  $2\frac{1}{2}$  fathoms, and 10 fathoms from the chains opposite.

The Gunjaver, with a westerly wind, laying up N. N. W. in soundings from 20 to 13 fathoms, got between the southernmost shoal and the shore: after tacking in 15 fathoms, lay up west, and run 2 miles on this course, in soundings from 9 to

15 fathoms soft; then 12 fathoms hard ground; next cast 4 fathoms and grounded on the inner edge of the bank, Cape Rachado S. E.  $\frac{1}{2}$  E. and the northern extreme of the land (Parcelar Point) N. W. b. W. Laid out the Kedge, and hove the ship clear off the ground into 3 fathoms, run out into 8 fathoms, the pitch of the Cape then S. E.  $\frac{1}{4}$  E. and Parcelar Point N. W. b. W. off shore 4 or 5 miles, off Cape Rachado about 5 leagues.

The Portuguese ship Carmo, aground on one of the patches in the bight, had Cape Rachado S. E.  $\frac{1}{4}$  E. when in 11 feet water, and Parcelar Hill about N. W.  $\frac{1}{4}$  N. Do not bring Cape Rachado to the southward of S.  $60^{\circ}$  E. or Parcelar Point to the westward of N.  $43^{\circ}$  W. in passing the shoals in the bight between them.

His Majesty's ship Trident, had 5 fathoms on one of the spots on the eastern part of the South Sand, with Cape Rachado E. b. N. and Parcelar Hill N. b. W.  $\frac{1}{4}$  W.

On one of the rocks about  $1\frac{1}{2}$  or 2 miles off shore, nearly mid-way between Cape Rachado and Malacca, the snow Forth grounded, the anchor being previously let go in 12 fathoms. About 5 or 6 miles to the south-eastward of Cape Rachado, there is a small bank in the channel, with from 10 to 13 fathoms water on it.

On the reef extending to a small distance from Fisher's Island, the Sarah, in borrowing too close, had 5 fathoms: in the same manner, being a little more close, a snow from Manilla grounded upon it in 1789. There is said to be a small bank, with  $3\frac{1}{2}$  fathoms on it, with Fisher's Island N. N. E. 2 miles, lately discovered; but I think this very doubtful.

On the bank, about 6 leagues south-westward from the Water Islands, the Milford grounded; and, a few miles more northerly, we had a cast of 8 fathoms.

On the Bank abreast of Formosa River, described in the Explanatory Remarks, where the Asia was aground, Captain Sheperdson had  $2\frac{1}{2}$  fathoms in the ship Murad Bux, in 1800. From the shoalest part of this bank, a spit extends a great way to the north-westward, with 5, 6, and 7 fathoms water on it, which probably reaches to the shore, a little eastward of Tanjong Tor, or about S. S. E. from Mount Mora: and, it is thought, that a spit of shoal water projects from the shoal part of the bank, towards Point Sizan, connecting them together. Between the Formosa Bank and the shore, there are regular soundings 11, 12, and 15 fathoms, soft ground. On the outer edges of it, the depth decreases rather suddenly; but the lead, if kept quickly going, will indicate the approach to it, and give warning to tack. This bank consists of black sand, the shoalest part distant from Point Sizan about 4 miles, and nearly the same distance from the land, on the north-west side of Fomosa River's

entrance. About 5 miles W. N. W. from Formosa Bank, there is a small bank of 10 and 11 fathoms, with 16 and 17 fathoms within it.

About S. W. from Mount Morea,  $3\frac{1}{2}$  or 4 leagues from the Sumatra Shore, there is a bank, on which we had from 25 to 11 fathoms, deepening regularly when over it, in standing towards the Sumatra Shore to 22 and 23 fathoms. There are in the fair channel here, and in other parts of the strait, small banks with from 9 or 10 to 14 and 15 fathoms on them, which may be a cause of anxiety (to persons unacquainted) in the night.

Exclusive of the bank extending along the shore, from Mount Formosa to Pulo Pisang, there are three banks between it and the Sumatra Shore. The first extends in the direction of the channel, parallel to the shore, and may be denominated as the fair channel bank, which is situated a little nearer the Shore Bank than the Long Middle Bank. Mount Formosa bears about north from its northern extremity, and Pulo Pisang about north from its southern extreme. It is possible that this is not a continued extent of one bank; as it has been crossed over with the lead kept going, without getting a cast upon it: but if there are gaps (of the same depths of water as in the fair channel) through this bank, these gaps must be of small dimensions; for ships in turning, making long tacks, generally get soundings in crossing over it, from 8 to 11 or 12 fathoms. It has been noticed in the Explanatory Remarks, that the least water on this bank is  $6\frac{1}{2}$  or 7 fathoms, towards its southern limit.

Six or seven miles from the bank just mentioned, and extending parallel to it and the shore, the Long Middle Bank is situated, nearly in mid-strait, between the Malay and Sumatra Shores. It has been already observed, that the northern limit of this bank is about S. S. W. from Mount Formosa; from thence being a continued bank, with shoal soundings on it, to the north end of the Great Carimon. Although 4 and 5 fathoms on the northern extremity of the Long Middle Bank have often been experienced, it is probable that no ship will ground on any part of it, except drawing 23 feet water. It may be said not dangerous, for it consists mostly of mud, which is mixed with fine black sand, on the northern and shoalest parts. In ships drawing 21 feet water, we have frequently crossed over this bank, without apprehending the smallest danger: on its southern part, towards the Carimons, the depth is 7 and 8 fathoms. Both the Long Middle Bank, and that in the fair channel, between it and the Shore Bank, are narrow, though of great extent from north-west to south-eastward.

To the southward of the north part of the Long Middle Bank, about half way between it and the Sumatra Shore, is situated the Sumatra Bank, or third in number

from that contiguous to the Malay Shore: this is imperfectly known, as few ships approach near the Sumatra Shore in this part of the strait. The Locko grounded on this bank, and had  $2\frac{1}{2}$  fathoms at low water, sand and mud, Mount Formosa bearing N. b. E. 9 or 10 leagues; Pulo Pisang E. N. E. 8 leagues, and the extremes of the Sumatra Shore from S. W. b. S. to S. E. b. S. distant about 3 leagues. Previous to grounding, the Locko passed over a bank of 4 fathoms; Mount Formosa then set N.  $\frac{1}{2}$  E. and Pulo Pisang E. N. E. off the Sumatra Shore 3 leagues. After floating off the ground, they anchored in 5 fathoms, and shortly after weighed; steered N. E. with the boats ahead, shoaling to  $3\frac{1}{2}$  fathoms, then deepening to 16 fathoms; from thence steered east, and shoaled again to 7 fathoms; shortly after deepened to 15 fathoms, in the channel between the Sumatra Bank and Long Middle Bank.

From the Locko having got upon several shoal spots, it may be inferred that this bank, towards the Sumatra Shore, is not a continued regular bank, but consists of separated shoal patches.

On one of the projecting spits of the Shore Bank, southward from Pulo Pisang, the Gunjaver had 3 fathoms in the stays, and touched the ground; the outermost island off Pulo Pisang bearing N. W.  $\frac{1}{4}$  W. and the innermost island N. N. W.  $\frac{1}{4}$  W. distance from Pisang about  $2\frac{1}{2}$  miles.

To the southward from Pulo Cocob opening, and around Tanjong Boulus, the bank extends about  $1\frac{1}{2}$  or 2 miles from the shore, and is steep to on the outer edges. The Milford grounded on it in 1786: it consists mostly of mud. In company with the fleet from China, his Majesty's ship Dedaigneuse, steering W. b. N. grounded in the night on this mud bank, and had eight feet water over the starboard bow, five fathoms under the stern: and the anchor laid out to heave the ship off by, was in 17 fathoms water, with two thirds of a cable out, in an E. S. E. direction. When aground had the following bearings, the ship's head W. N. W. Eastern rounding of Tanjong Boulus N.  $58^{\circ}$  E.; western rounding of it N.  $46^{\circ}$  W.; north-east side of Pulo Cocob N.  $48^{\circ}$  W.; south-west end of Cocob N.  $57^{\circ}$  W.; north-west end of Little Carimon S.  $50^{\circ}$  W.; south end of it S.  $33^{\circ}$  W.; North Brother, W.  $28^{\circ}$  S.; the limit between the low green Mangroves, to the eastward, and high trees westward, bearing north; distance from the nearest part of the shore about one mile and a quarter. Towards Pulo Cocob opening, this mud bank projects a little further from the shore; 14 fathoms is near the verge of it, in this part.

About five miles north-westward from Barn Island, and nearly the same distance northward from Tree Island, is a rocky shoal, on which the ship Sultan grounded in 1789. When aground, the north end of the Little Carimon W. b. S.  $\frac{1}{2}$  S.; an island



near the Strait of Sincapour N. W. b. N. ; the south end of Barn Island E. S. E.  $\frac{1}{2}$  S. ; and the Rabbit and Coney just open, distant about six miles. There is only three feet rocks on the shoalest part of this danger, at low water.

The banks or dangers, in Sincapour Strait, have been already described, in the Remarks for that strait. The ship Dart, in working between the Coney and St. John's, standing too far to the northern side of the channel, struck on the reef east-south-eastward from Middle Island. The Carron, in February 1804, passing from St. John's towards the Coney in the night, by hauling close over towards the northern side of the channel, after passing St. John's, got inside of the rocky reef just mentioned, and rubbed against the north side of it. Being steep to, and apparently coral, she received no damage.

A Portuguese ship got aground upon the spit which projects out from the east end of Sincapour Island, near the Red Cliffs: and is generally called Johore Shoal.

N.B. Bearings of land being often carelessly taken, and compasses disagreeing frequently, there may be, in consequence, some of the preceding bearings in this description incorrect.

## ERRATA

### IN THE MEMOIR OF A CHART OF THE CHINA SEA.

- Page 2, line 18, *for de Conte's, read de Conde's.*  
— 24, — 6, from bottom, *for north-westward, read northward.*  
— 28, — 1, *for frequently, read frequent.*  
— 29, — 2, *for longitude 116° 26' E. read 116° 46' E.*
- 

## ERRATA

### IN THE MEMOIR OF THE NAVIGATION OF THE STRAITS OF MALACCA AND SINGAPOUR.

- Page 4, line 13, at the end of the line, *after on, read the.*  
— 8, — 11, from bottom, *for is, read are, after depths.*  
— 11, — 10, from ditto, *for off, read of.*  
— 15. — 2, from ditto, *for off, read of.*



**MEMOIR**  
**OF**  
**THE NAVIGATION**

**TO AND FROM**

**China,**

**BY**

**STRAITS AND CHANNELS TO THE EASTWARD.**

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**1805.**



# MEMOIR

## OF THE

### NAVIGATION TO AND FROM CHINA.

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#### I. GENERAL OBSERVATIONS.

**A** SHIP which sails well, and in good condition, departing from Hindostan or Bengal, any time before the middle of September, bound to China, will probably make the quickest passage, by proceeding through Malacca Strait, and from thence up the west coast of Palawan and Luconia: for ships have made their passages both in November and December, up these coasts.

If difficulty appears in pursuing this route, from the Island Balabak, a ship may proceed through the strait between it and Banguay, and stand over to the Philipines: then by working close along the western side of these islands, she may probably soon reach the south-west end of Mindora, and from thence get easily along the coast of Luconia to China.

But in a ship which sails indifferently, it may probably be prudent to adopt the passage to China by some of the eastern routes, if September is advanced before she departs from Hindostan.

The Strait of Maccasser may be chosen, if a ship arrives there in November or December; but in January and February, strong winds generally blow from the northward, forcing a strong current constantly through this strait to the southward,

which prevent a ship from making any progress during these months. This is generally the case, and the passage by this strait seems not so certain, as that by Dampier's Strait, in December, January, and February : notwithstanding, there are some solitary instances, of ships getting easily through the Strait of Maccasser in these months ; but this is not to be expected, if the following remarks can warrant such inference.

In the *Anna*, a coppered ship, we rounded Pulo Laut January 16th, 1793, and did not reach Point Donda (or Cape Donda) until the 6th of March, being 40 days in acquiring the distance of about 116 leagues ; the wind being constantly from the northward, with strong southerly currents. At this time, two American ships in the strait, bound to Manilla, one of which, though a good sailer, after beating against the wind and current some time, returned to Batavia, judging the passage impracticable through the strait.

The *Canada* of London, a whaler, with a packet from Madras to China, reached Cape Donda in February 1792 ; after beating here three weeks, without gaining ground ; stood on a wind to the northward, with a north-easterly wind, and passed through a narrow channel between two of the islands on the east side of Sooloo, in  $5\frac{1}{2}$ , 6, and 7 fathoms, muddy bottom. From thence proceeded up the Mindora Sea, and passed between the Calamianes and Apo Bank ; then along the west coast of Luconia to Macao, having a quick passage from Cape Donda.

If February is far advanced before a ship passes Batavia, or the southern part of Maccasser Strait, it appears then too late to proceed for Dampier's Strait, or by any other channel into the Pacific Ocean : but she ought in this case, to adopt the passage of Maccasser Strait, then along the west side of the Philippine Islands to China ; for in March, the southerly current abates in this strait. And in March and April the weather is mostly pleasant, with favourable leading breezes on the west sides of these islands\*. On the 13th of March 1793, we made the Island Baseelan, passed up the west side of Mindano, Negroes Island, Panay, Mindora, and Luconia, having a middling good passage from Baseelan to China, and very fine weather.

\* On the west sides of these islands, there are variable winds and sea breezes near the shore, during the whole of the north-east monsoon, as well as in the south-west monsoon.

## II. PASSAGE BY THE STRAIT OF MACCASSER.

WHEN circumstances admit, the track from Hindostan towards the Strait of Maccasser, by Sunda Strait, and to the northward of Java, is probably more speedy than by passing to the southward of Java. The following remarks are applicable to the former route.

### ENGONA ISLAND.

Running for the Strait of Sunda, the Island Engona is in the track; I made the south end of it in latitude  $5^{\circ} 26'$  S. and longitude  $102^{\circ} 20'$  E. by stars on both sides the Moon: and by chronometer  $2^{\circ} 50'$  W. from the west part of Prince's Island.

### PRINCE'S ISLAND.

The north part in latitude  $6^{\circ} 27'$  S. and the peak on its eastern part in longitude  $105^{\circ} 23'$  E. by chronometer, from lunars. Crocotoa Island in  $105^{\circ} 37'$  E. by the same means.

### BATAVIA ROAD.

By whatever channel a ship enters this road, care is requisite to avoid the shoals, for there are not always beacons upon them: these being sometimes stolen by the fishermen, and frequently carried away by the north-west monsoon. When a beacon is lost, it is sometimes not replaced for months, or even years: this was particularly observed to be the case, with the Rynland Beacon, which is perhaps the most essential about this place.

The Rynland Shoal bears about N. b. W. from the shipping in the road, not far distant: it is on with Kuyper's Island, bearing W. N. W.  $\frac{1}{2}$  N. and is about the length of a large ship, with only 10 feet water on it.

Homeward bound from China in 1792, there was no beacon on this shoal; and seven months afterward, when outward bound, the beacon was still wanting: but returning from China this voyage, found a new beacon had been placed (a few days previous to our arrival) on the Rynland Shoal.



Coming from the westward towards Batavia Road, the channel frequented by the Dutch ships, between Onrust and Java, is probably the best. Ships adopting this channel, pass between the Great Cambay and Maneater's Beacon, which is situated on the end of the reef projecting to the eastward\* from Maneater's Island; then steer to leave the Islands Middleburgh† and Amsterdam to the northward, and between them and Ountong Java Reef Beacon to the southward. Ountong Java Reef extends from this part Java, a great way over towards the islands, having a beacon on the northern extremity, between which, and another beacon near the south-east point of Middleburgh, is the channel, having 8, 9, and 10 fathoms water in it, in this part.

When past Amsterdam Island, steer to pass on the west side of all the islands; viz. Schedam, Rotterdam, Onrust, and Kuyper's Island: in doing so, when abreast of Schedam, a ship should borrow towards the edge of Ountong Java Reef, which is sand, and run along the edge of it in five fathoms; the depth decreasing regularly on the eastern edge of this shoal. In mid-channel here, between it and the islands, the depth is 6 and 7 fathoms. By keeping on the verge of the reef, a rock is avoided, which is situated about mid-channel, north-westward from Onrust. Several ships have got on this rock, there being often no buoy or beacon on it.

When past Kuyper's Island, a beacon will be seen on a shoal near the Java Shore, which is left to the southward in passing.

From Purmerant Island a rocky reef projects to the south-eastward, which is sometimes provided with a beacon: if it is perceived, leave it well to the northward. When round Kuyper's Island, and no beacons perceived, steer direct for the outer part of the shipping in Batavia Road: in passing along, several beacons perhaps may be seen, situated on spots of shoal water near the Java Shore, which must all be left to the southward, in passing. On nearing the road, if the beacon on the Rynland Shoal is seen to the north-eastward, pass to the southward of it, and anchor in the road in 7, 6, or 5 fathoms, at discretion. Ships seldom moor, the anchors being buried in the soft mud.

The channel between Amsterdam and Schedam, then between the Islands Harlem and Hoorn, is equally safe. To enter Batavia Road by this passage. When through the channel between Ountong Java Reef and Middleburgh and Amsterdam Islands, as previously mentioned, and passed the south-east point of the latter, steer to the

\* This reef also projects northward from Maneater's Island, and has sometimes no beacon.

† Keep the Flagstaff on this island at least 3° to the northward of east, to avoid the Raramba Shoal, which bears due west from Middleburgh Island near two miles, and has seldom a beacon on it.

eastward towards the small low Island Harlem, passing to the northward of Schedam : when near Harlem, steer between Hoorn Island and Rotterdam, keeping nearest Hoorn, on account of a reef projecting from Rotterdam, a small distance to the south-eastward. When past Hoorn Island, be careful not to haul much to the westward, in steering for Batavia Road, on account of Purmerant Reef, which extends southward and eastward from Pumerant Island, to a considerable distance : it is only visible in a heavy swell, the water then breaking upon it, at low water.

To avoid this reef, when past Hoorn Island, steer to the south-eastward, until the dome of Batavia church bears S.  $\frac{1}{4}$  E. or S.  $\frac{1}{2}$  E. ; then direct for the road, keeping the same bearing, which carries a ship well to the eastward of Pumerant Reef, and between the Rynland Shoal on the westward, and eastern reef beacon to the eastward, directly amongst the shipping.

In entering by the great channel, between Edam and Hoorn Islands, keep the dome as before observed, S.  $\frac{1}{2}$  E. until near the road.

The passages between Leyden and Alkmaar, and between Edam and Enkhuysen Islands, are also very safe. The soundings in these channels, amongst the islands, are from 8 to 12 fathoms, even bottom. The beacons generally consist of a single piece of a tree, with a piece of board nailed on the upper part of some of them, in the form of a cross ; they are however not conspicuous. An exception to this was, in 1793, for the Rynland Beacon, made of several pieces of timber, floated on the surface of the water, and was seen at a greater distance than the other beacons.

There is a beacon on the Eastern Reef (or Father Smith's Island), part of which is dry at low water spring tides. Ships bound out or into the road, by the Great Channel, or Leyden Channel, pass to the westward of this beacon, there being no passage to the eastward of it for a large vessel. This beacon is on with the body of Leyden Island, N. b. E.  $\frac{1}{4}$  N. and is in sight from the road.

The longitude of Batavia, by mean of many observations of stars and sun on both sides of the Moon, taken here at three different periods  $106^{\circ} 56' 30''$  E. from Greenwich. Edam Island in  $107^{\circ} 00'$  E. and its latitude  $5^{\circ} 57' S$ .

#### FROM BATAVIA TO MORESSES.

From Edam the Island Moreses bears N.  $80^{\circ}$  E. 184 leagues. In the sea between Java and Borneo, in the strength of the north-west monsoon, part of November, December, and January, being the time when it blows very severe in the squalls, and the weather generally cloudy with much rain, it is prudent to steer from Edam

about E. N. E. 40 leagues, if observations are not obtained, to be certain of passing clear to the northward of Carimon Java, situated in latitude  $5^{\circ} 50'$  S. The current sometimes setting about E. S. E. in the season, may place a ship more southerly than supposed, when the latitude is not known by observation.

From Edam the depth of water increases to 28 or 30 fathoms, when 40 leagues to the east-north-eastward: from thence steering between E. and E. b. N. you will have from 30 to 34 fathoms, till within ~~30~~ or 45 leagues of Point Salatin, and steering on about E.  $\frac{1}{2}$  N. will gradually decrease the depth of water. If in 14 or 15 fathoms, when abreast of Point Salatin, you will be about seven leagues from it. This point is in latitude  $4^{\circ} 09'$  S. and about 14 or 15 leagues westward from the Island Moresses. Point Salatin should be passed within 8, or at most 10 leagues, to give a wide birth to the Island Arentas\*, near which are supposed to be some shoals, and to the westward of it is a rock, or shoal, on which an American ship struck in January 1794.

#### ISLAND MORESSES.

This island is small, but high; the summit having a regular peaked appearance. There are several large rocks near it above water. Made the latitude of Moresses  $4^{\circ} 25'$  S. and longitude  $116^{\circ} 03'$  E. by sun, stars, and moon observations.

The northernmost of Little Pulo Laut Islands, are situated south-westward from Moresses, and the channel about eight leagues wide between them; the soundings about 18 fathoms in mid-channel. In passing with the wind at north-west, it is prudent to borrow towards the north side of the channel: the passage southward of the Moresses, appears preferable to that northward of this island.

#### DWAALDER AND THE BROTHERS.

The Island Dwaalder bears from Moresses N.  $54^{\circ}$  E. distant  $7\frac{1}{2}$  leagues, in latitude  $4^{\circ} 12'$  S. and longitude  $116^{\circ} 21'$  E. The Two Brothers bears nearly due east  $9\frac{1}{2}$  or 10 leagues from Moresses, in latitude  $4^{\circ} 26'$  S. and longitude  $116^{\circ} 32'$  E.; the channel between the Dwaalder and Brothers is about six leagues wide, with 15 and 16 fathoms water in mid-channel. The Brothers are two small round islands: the

\* This island is more westerly than placed in most charts.

Dwaalder is rather lower than the former, and higher at the east and west ends than at the centre. There is a safe passage, to the northward of Moresses and Dwaalder Islands, which may be used occasionally.

#### ISLANDS OFF THE SOUTH PART OF PULO LAUT.

The three islands near the south end of Great Pulo Laut are all moderately high; there is depth sufficient for a ship to pass between the southernmost island and the middle island, but this channel is very narrow and improper for large ships. The Button, a small round island, lying off the south-east part of the southernmost island, near it, resembles a button, and may be passed very close on the east side, by ships passing from the Dwaalder with a scant wind towards the east side of Great Pulo Laut.

#### FROM THE DWAALDER TO THE THREE ALIKE ISLANDS.

The Three Alike Islands bear from the Dwaalder N.  $47^{\circ}$  E. 15 or 16 leagues distant; the soundings between them 16 and 17 fathoms, from 4 to 6 leagues off Pulo Laut. Abreast of the Button, one mile distant, the soundings are 11 and 12 fathoms. The Three Alike Islands are small, and may be seen from the deck at 5 or 6 leagues distance: the channel between them and Pulo Laut is about six leagues wide, and equally safe, as passing outside of them there is 13 fathoms within a mile of them on the west side, and 20 to 22 fathoms to the eastward of them, at 2 or 3 leagues distance, and no danger near these islands. The latitude of the Three Alike Islands is  $3^{\circ} 41'$  S. and longitude  $116^{\circ} 54'$  E. by sun, stars, and moon observations.

#### GREAT PULO LAUT.

The east side of this island appears free from danger; the soundings are generally from 13 to 15 fathoms,  $2\frac{1}{2}$  or 3 leagues off shore, and from 20 to 22 fathoms 8 or 10 leagues off; but in some places, particularly towards the north end of the island, not always regular. Abreast of the Alike Islands, near the shore of Pulo Laut, are several small islands; and a reef is said to project from the north-east point of Pulo Laut to a considerable distance.

Between the north-east point and north end of this island, is a very deep bay, with some islands on it. The north end of Great Pulo Laut is in latitude  $3^{\circ} 13' S.$ ; the north-east point in  $3^{\circ} 23' S.$  and longitude  $116^{\circ} 41' E.$  by chronometer, and observations of stars on both sides the moon. The east side of this island is middling high, sloping with a gradual declivity towards the north-east point; the north-west part is very high land; the soundings hereabout are all soft ground.

#### FROM THE THREE ALIKE ISLANDS TO SHOAL POINT.

Shoal Point bears N.  $6^{\circ} W.$  from the Three Alike Islands, distant 22 leagues; the land between them, in some places, is rather low; the soundings mostly regular, except a few overfalls; from 10 or 11 fathoms, to 7 or 8 fathoms, soft ground, are sometimes got in the channel, about 4 or 5 leagues off shore. In turning here, you may stand in to 7 or 8 fathoms, and off to 15 or 16 fathoms, about 6 or 7 leagues off shore.

#### SHOAL AND RAGGED POINTS.

Shoal Point is the southern extreme of a level piece of land, about nine leagues in length. A deep inlet, like the entrance of a river, appears on the south side of this point. In steering a straight course, the depth of water decreases abreast of Shoal Point two or three fathoms; and when past it, increases to the former depth. A reef appears to project from Shoal Point to the southward, there being some shrubs and rocks above water, detached from it, in a southerly direction; but may be approached with safety to six fathoms, the depth decreasing gradually on the flat contiguous to Shoal Point.

The latitude of Shoal Point is  $2^{\circ} 35' S.$ ; longitude  $116^{\circ} 47' E.$  by objects on each side of Moon.

From Shoal Point to Ragged Point, the course is nearly North, distance  $8\frac{1}{2}$  leagues. In this track the depth decreases fast towards the land. Care is requisite in passing along here, to keep clear of some sand banks and coral shoals, situated in the Offing; and two sand banks even with the surface of the water, near Ragged Point. In passing from Shoal Point to Ragged Point, the soundings are no. a perfect guide, to lead a ship between the outer and inner shoals; there being some overfalls. But it may be observed as a general rule not to deepen above 15 or 16 fathoms towards the outer

shoals; they being situated in 17 and 18 fathoms, about four leagues from the Borneo Shore. The inner sand banks bear S. E. from Ragged Point from 3 or 4 to 5 or 5½ miles. The best track, when near the latter, is about 6 or 7 miles off shore, in 14 or 15 fathoms water; the soundings between the inner sand banks, and round them, are mostly 9, 10, and 11 fathoms, with some holes of deeper water. The passage within the inner sand banks is probably safe, as they appear to be near 4 miles distant from the shore. These two banks are probably covered at high water springs; for only a little white sand appeared above water, in passing them.

One of the outer shoals bears from Ragged Point S. 35° E. and from Flat (or Shoal) Point N. 47° E. distant from the Borneo Shore about 3½ leagues: it is a narrow shoal, on which the water seldom breaks; having different depths, from 1½ and 2 fathoms, to 3 feet water on it; the bottom sand and coral—17 and 18 fathoms is close to it.

The other two outer shoals are said to bear about E. b. S. from the two inner banks, having 17 fathoms water close to them; these being sand banks above water. Ships ought not to pass between these outer shoals, and the Little Pater Nosters.

Ragged Point is the northern extremity of the piece of level land, extending from it to Shoal Point; and is the north-east projection of the land, on the south side of Passier Bay, formerly a place of considerable trade. There is said to be a reef projecting from Ragged Point, to a small distance in a northerly direction. This Point is in latitude 2° 10' S.; and longitude 116° 48' E. by mean of observations, many sets on both sides of Moon, corroborated by chronometer.

#### PATER NOSTERS.

The Little Pater Nosters are a group of small islands, with many shoals and sand banks interspersed among them: their western side is lined with dry sand banks, and dangerous coral flats.

Coming through Maccasser Strait from China, in 1792, we made the north-east island of the Pater Nosters, and steered along the north side of them, at about 4 leagues distance; towards the Borneo Shore: had no soundings until the north-westernmost islands bore south, seen from the top; then had ground 34.20 to 14 fathoms coral rock, and anchored: found the current setting S.W. one mile an hour. This being July.

After weighing, stood to the westward for the Borneo Shore, with the long boat a head sounding: had great overfalls, from 30 to 12 or 16 fathoms; then no ground with 30 and 35 fathoms.

When two of the north-westernmost islands bore about south-east, seen from the mast-head; saw nine dry sand banks, bearing from South to S. E. b. S. with a few shrubs on two of them. Our distance from the nearest of these sand banks, about 7 or 8 miles; then had great overfalls. On one spot we crossed, had only 5 fathoms: and on another, the boat had  $5\frac{1}{2}$  fathoms close to the ship.

When the land of Borneo was plainly visible from the deck, bearing W. b. S.  $\frac{1}{2}$  S. and the northernmost island of the Pater Nosters, just in sight from the mast-head, and in one with the body of the sand banks bearing S. b. E. deepened to 40 fathoms; and then no ground with 50 fathoms. At this time the latitude observed was  $2^{\circ} 06' S.$  After running to the westward about two miles, got ground 36 fathoms; and continued to shoal regularly, the bottom mud and gravel. When in 20 fathoms, saw Ragged Point from the mast-head, bearing W. S. W. about 8 leagues; and steered for it, till in 15 fathoms.

The Coral Flats extend about 8 or 9 leagues north-westward from the Pater Nosters, are very extensive, and probably dangerous: for, being composed of narrow coral ridges, there may be much less water than 5 fathoms on some of them, although we had only one cast of that depth.

To avoid these Coral Flats; on leaving Ragged Point, a ship should not stand off shore, to more than 20 or 22 fathoms, until to the northward of 2 degrees south latitude: and, in coming from the northward, not to cross the parallel of  $2^{\circ} S.$  before getting in with the Borneo Shore. The north-west island of the Little Pater Nosters is in latitude  $2^{\circ} 08' S.$ ; the longitude  $117^{\circ} 42' E.$  or 54 miles East from Ragged Point, measured by chronometer.

The latitude of the northernmost sand banks to the westward of the islands, is  $2^{\circ} 07'' S.$  about three leagues to the westward, from the nearest island.

The northernmost island of this group is in latitude  $2^{\circ} 10' S.$ ; and longitude  $117^{\circ} 58' E.$  by chronometer.

#### FROM RAGGED POINT TO DONDREKIN ISLAND.

The south end of Dondrekin Island bears from Ragged Point about N.  $32^{\circ} E.$  distant 30 leagues; and in latitude  $00^{\circ} 54' S.$ ; and in longitude  $117^{\circ} 36' E.$  by chronometer, measured from lunars.

The coast of Borneo, from Passier Bay to Dondrekin Island, is low near the sea; but there are several detached mountains inland. Here the depth is from 25 to

30 fathoms, 4 or 5 leagues off shore ; and supposed to decrease gradually towards the land.

To the northward of the parallel of 2 degrees south latitude, the strait is clear from side to side.

#### DONDREKIN ISLAND AND REEF.

Dondrekin is a long low island, separated from the eastern shore of Borneo by a narrow channel ; like the entrance of a river, when viewed from the southward.—There is said to be some small banks of sand, about two or three miles off the south part of this island ; and a shoal (or reef) surrounding it ; towards the south and south-east edges of which, the depth decreases gradually ; but is steep to, on the northern part. To the northward of Dondrekin Island, there are no more soundings on the Borneo coast, except very near the shore.

#### WEST SIDE OF CELEBES.

William's Cape is in latitude about  $2^{\circ} 20'$  S. and in longitude  $118^{\circ} 58'$  E. by chronometer. It is a high head land, by which a bay is formed to the northward. From the cape, along the west side of Celebes, to the northward, the land is all very high a little inland ; and of moderate height in some places near the sea. It is a steep and bold coast ; at three leagues distance from the shore, we got no ground. Were all the month of February endeavouring to get to the northward of Point Samsa ; the current constantly strong to the southward, with small eddies in the bays, when near the shore.

Cape Temoel (or Point Samsa) is a high head land, projecting considerably to the westward into the sea ; by which a deep bay is formed on each side, one to the northward, and one to the southward of it. The north-west point of this cape projects farthest out, and is in latitude  $00^{\circ} 01'$  N. ; the longitude, by chronometer, from lunar observations,  $119^{\circ} 26'$  E. About four or five miles westward from it, is a small round island, called South Wachter (or Watcher) by the Dutch. A reef extends from this island to the south-eastward ; and some rocks appear above water, between it and the cape, which seems to preclude any safe passage within it.

Cape Donda (or Point Donda) bears from Cape Temoel N.  $33^{\circ}$  E. distant 19 leagues ; and from the south part of Dondrekin Island N.  $54^{\circ}$  E. distance 58 leagues. Cape Rivers bears from Donda N.  $55^{\circ}$  E. distance 16 leagues.



## POINT DONDA AND CAPE RIVERS.

Donda Cape (or Point) is in latitude  $00^{\circ} 48' N.$  ; and longitude  $119^{\circ} 57' E.$  by sun and stars on each side the moon ; and Cape Rivers by the same means in longitude  $120^{\circ} 34' E.$  and latitude  $1^{\circ} 15' N.$

The land over Cape Donda is remarkably high ; and between it and Cape Rivers, is all high, at a small distance inland. The mountains over Cape Donda have a steep declivity, forming several head lands ; which prevent the cape from being easily distinguished.

There is said to be soundings from 40 to 50 fathoms, to the southward from Cape Donda, at two or three leagues off shore. Between Capes Donda and Rivers, there are several small islands situated near the shore, which are all steep to. The line of the coast forms a small degree of concavity between these capes.

There are two small islands close to Cape Rivers. The land over it has a regular declivity in its projection to form the cape, with a gap not far within it, which makes the cape appear like an island at a great distance.

## POINT KONNEEOONGAN, AND THE SEVEN ISLANDS, &amp;c.

Point Konneecoongan, or Van Geysen's Hock, is the outermost point of a remarkable long piece of land, which extends out near a degree to the eastward, from the main land of Borneo ; and is only a few miles in breadth. There is a middling high but small island, situated about three leagues to the southward, from Point Konneecoongan. The shore here, like the Celebes opposite, is very steep ; there being no soundings until close to it. A ship to the southward, under Point Konneecoongan, experiences no southerly current, when it is running strong in, between the Point and Cape Donda outside ; the great length of this projecting piece of land occasions an eddy current, when under it.

The seven stones, placed in the old charts, about mid-channel between Cape Donda and Point Konneecoongan, do not exist ; the Seven Islands being the only islands in this part, which are situated to the southward of Cape Donda, and near the Celebes shore. The body of these, are in latitude  $00^{\circ} 32' N.$  ; they are low, and not easily distinguished from the main land, except when near them ; unless it be the outermost, called Noord Wachter by the Dutch, which is at a considerable distance from the others, being about five or six leagues off shore. This island appears smaller than

the others, and may be seen five or six leagues from the deck. It is in latitude about  $00^{\circ} 33' N.$  and the channel within it said to be safe. Point Konneeoongan, in latitude  $1^{\circ} 14' N.$  and longitude  $119^{\circ} 07' E.$  is high and even land:—between it and Cape Donda, is the narrowest part of the strait, being here about 18 leagues wide.

Having reached Cape Donda, to proceed into the Pacific Ocean, a ship should endeavour to get well to the north-eastward, that she may be able to pass through among the Sanguey Islands well to the northward, and counteract the south-west currents, which, in the months of November, December, January, February, and March, generally set through between Mindano and Celebes, to the south-west\*.

Several ships, after passing to the southward of Siao, have been set down towards Moratay by the current, and weathered the north part of this island with difficulty. While others have passed to the eastward, in sight of the north coast of Celebes; and got easily out into the ocean, without observing the precaution, of keeping to the northward.

The north side of Moratay, and the islands between it and Mindano, are mostly all bold steep shores; without soundings, until close to them.

In passing out among the islands, it must be observed, that a reef of breakers extends a considerable way out from the east point of the Island Salibobo: the south-end of this island appears to be in latitude  $3^{\circ} 44' N.$  by the Fly Cruizer; and in describing this reef, says it projects out from the east point of the Island Salibobo. This is the southernmost of a group of islands, situated north-eastward from Sanguey; are sometimes called the Tolour Islands, and sometimes Salibobo Islands. The Fly describes a reef, extending out from the east point of the southernmost island. Captain Rees, in passing with a convoy, round the south-end of the southernmost Tolour Island, passed outside of a shoal of breakers, about three miles in extent, and a small part of a sand-bank dry; situated about two leagues from the south-east point of the southernmost Tolour Island. It is not placed in Captain M<sup>c</sup>Namara's Plan: probably he passed very near it in the night; as may be inferred from the Glatton's Track, between this island and Sanguey (or Sanguen).

\* On the north side of Celebes, near the N. E. point, at the village of Menado, supplies of rice, and other provisions, are procurable, it being a rice country, and the natives hospitable here, and also round the N. E. point, on the east side: differing much from the inhabitants of the west side of Celebes, where they are perfidious.

## PACIFIC OCEAN.

Having entered this ocean by any of the eastern straits, sufficient easting ought to be obtained in a low latitude, to enable a ship to weather the north part of Luconia, with the north-east winds, which blow strong with a high sea in the north-east monsoon. There is also a westerly current prevalent, in the strength of this monsoon, which is from September to February, rendering it prudent for a ship to pass to the eastward of the Pellew Islands at this time; for some ships, by passing to the westward of them, have with difficulty weathered the north end of Luconia.

Should a ship enter the Pacific Ocean, late in February or March, the strength of the north-east winds being then abated, it is not requisite to gain so much easting, as at an earlier period.

In the track of getting to the eastward, there are a number of small low islands, which ought to be passed with great caution in the night, the true position of several of them, not being correctly known.

One of the greatest dangers is an extensive reef of rocks and breakers, not placed in the charts; which is called Helen's Shoal, by Captain George Seton, who passed near it in 1794. He saw high breakers extending several miles, and made their latitude  $2^{\circ} 50' N.$  and longitude  $131^{\circ} 41' E.$  or  $S. 75^{\circ} E.$  from Lord North's Island 40 miles by chronometer; the extent N. W. and S. E. five or six miles, the eastern verge a dry sand-bank; and the south-west part rocks, very little above water, with high breakers. Captain Hanson, in the Swedish ship *Wasa*, on his passage to China, in 1804, saw this shoal, and thought it a new discovery, not being placed in the charts. By his description, a high sand-bank faced the sea, with breakers: he places it in latitude  $2^{\circ} 50' N.$  and  $2^{\circ} 55' E.$  from the north-west end of Moratay, or  $2^{\circ} 00' W.$  from the southernmost Pellew Island, by chronometer.

This shoal was also seen by Captain Carteret, in the *Swallow*, on her voyage round the globe, but has never been projected on the charts.

If a ship passes far eastward from the Pellew Islands, a good look out is requisite for some of the westernmost of the new Carolinas, the positions of these islands being imperfectly known; one of them was seen by the *Exeter*, and is in latitude  $9^{\circ} 35' N.$  its south end in longitude  $138^{\circ} 9' E.$  A reef of breakers projects eight or nine miles, to the southward and westward from it\*.

\* This is supposed to be situated to the eastward of other islands, called Matelotas, which are thought to be in latitude  $8^{\circ} 35' N.$  but the longitude uncertain. In passing eastward of the Pellews, a good look-out is requisite for these islands. By the mean of six ships' chronometers and lunars, the south-westernmost Pellew Island is in longitude  $131^{\circ} 30' E.$

A ship in passing from the Pellew Islands to the Bashee Islands, from September to the month of February, ought to be, if possible, in a state to encounter bad weather; for some ships have perished, and others suffered severely, by storms, in this track. Although these are not always to be expected, it is prudent to be prepared; especially when near the opening, between Luconia and Formosa: for Ty-foongs, or violent hurricanes, have been experienced here in October, November, and December.

The channel between the Bashee Islands and Formosa is generally used, it being about 13 leagues wide from Grafton Island (the Northern Bashee) to Vele-rete Rock; the former in latitude  $21^{\circ} 06' N.$  and the latter in  $21^{\circ} 45' N.$  distant from the south-end of Formosa, about seven leagues.

The channel to the southward of the Bashee Islands, between them and the Babuyanes is also safe; and the channel between the Bashees, likewise supposed clear of hidden danger. There are some places where water may be obtained, and shelter afforded among the Babuyanes Islands, should a ship be disabled in a Ty-foong, or otherwise in distress; one of these is Musa Bay, a kind of harbour on the west side of Fuga, formed by the Islands Barrete and Mabag, to the west and northward; the entrance is from the southward; but the bottom is rocky, and this bay rather confined for large ships. Port San-Pio-Quinto is a small bay, or harbour, on the west side of the Island Camiguing, with an island in the entrance, and soundings from 20 to 10 fathoms within it, sand and coral. There are some rocky islets situated at a considerable distance north-eastward from Camiguing.

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### III. PASSAGE WEST OF THE PHILIPINE ISLANDS.

WHEN February is far advanced, and a ship passes Batavia, or is near Pulo Laut, it appears too late to proceed for Dampier's Strait, or to enter the Pacific Ocean, by any other passage: but, most probably, the quickest route will then be through Macassar Strait, and along the west side of the Philippine Islands.

## FROM CAPE DONDA TO THE ISLAND BASEELAN.

Being near Cape Donda, about the latter end of February, or any time in March, a ship should steer for the east part of Baseelan, in latitude  $6^{\circ} 30' N.$  and longitude  $122^{\circ} 38' E.$  by chronometer. The current, at this season, setting generally to the westward, requires to keep well to the eastward, when the winds will permit, to prevent being set near the Tawee Islands, situated south-westward from Sooloo.

If a ship, in standing across from Cape Donda, can only fetch Sooloo, she may pass to the westward of that island.

The channels among the islands, east from Sooloo, are also supposed safe \*. At present, too much confidence ought not to be placed in the Soolos, if obliged to stop for refreshment here : or on the south coast of Mindano, Baseelan, or other parts of the Soolo Archipelago, the natives being cruel and perfidious.

The principal dangers near Sooloo, to the northward, is the Takoot Paboonoowan Shoal; on some parts of which a large ship will ground : and the Griffin Rocks, which bear from the Island Saleelakit, about N. b. E. two leagues ; they are very dangerous, as the water does not break on them.

## CHANNELS ABOUT BASEELAN.

After leaving Cape Donda, if a ship makes the east part of Baseelan, she ought to pass through the channel between it and Mindano, which is the shortest passage amongst these islands.

There are two islands near the east end of this channel called Cocoa and Sibago ; the former is nearest to the Baseelan shore, and is low ; but part of Sibago is high, with low land between the hills ; which makes it appear as two islands at a distance. The channel between Baseelan and Mindano does not afford anchorage, except in the western part. In some charts, soundings are placed near the Mindano Shore, and among the islands contiguous. The Santa Cruz Islands, near Fort Caldera, or Samboagan, at the south-west end of Mindano, are small, with a reef about them, having only three fathoms rocky bottom on it, about two miles west from the southernmost island,

\* There is supposed to be a high rock, about 10 leagues S. S. Eastward from Belan.

which must be avoided, by giving a sufficient birth to these islands. There are frequent overfalls towards the Mindano Shore.

For dispatch, this channel is preferable to those southward of Baseelan; but the current, or tides, may sometimes retard a ship in entering it, when they are favourable for passing into the channels on the south side of Baseelan, which all appear to be safe.

That between Baseelan, and the islands southward from it, is said to be a good channel, but is not so wide as that formed by Belan and Tattaran on the south side; and Tapeantana and Lanawan to the northward: then to the westward on the south side of Tamook, and round the south-end of Mataha; from thence to the northward between Ballook Ballook, and the Peelas. Belan, the first island on the south side of this channel, is of considerable size; the western part forms a round high hill, from which extends a track of low land, several miles to the eastward. Tapeantana is low towards the east end, but has a regular peaked mount on the western part. The Island Boobooan, lying northward from Tapeantana, resembles much this island, having a mount of similar shape; they are situated near each other, with some low small islands near them to the eastward.

Lanawan and Tattaran are two small, but middling high islands; the channel between them is 7 or 8 miles wide; but between the eastern parts of Belan and Tapeantana, in the entrance, it is much wider.

The east ends of Belan and Tapeantana are nearly on a meridian; the latitude of the south point of the latter (or S. E. point)  $6^{\circ} 15' N.$  and longitude  $122^{\circ} 10' E.$  by stars on both sides of moon. The distance between these two points is about 5 leagues, being the difference of latitude between them, which will place the east point of Belan in  $60^{\circ} 0' N.$

Entering this channel from the eastward, there are no soundings till the west end of Lanwan bears north, or N. b. E. The bank is steep, for when soundings are got on the edge of it, the depth immediately decreases to 9 or 10 fathoms soft ground; and nine fathoms, was the least water we found in the channel. Towards Tattaran, in the south side of the channel, the water is deeper, but the ground not so soft and even as in the northern side. There are two small islands to the eastward of Tattaran and near Belan, called Dipoolool.

The Island Tamook is rather low, and about 4 or 5 leagues north-westward from Lanawan. When past Tattaran, the Duo Bolods (two remarkable Hummocks) are seen to the westward: the fair channel is between them and Tamook.

The soundings, when a few miles westward from Lanawan, increase in depth, and

are not so regular as before, but the bottom is fit for anchorage, being mostly sand and gravel, with some coral at times. Near Tamook, on the south side, the bottom is mostly coral, and the depth less, than at 4 or 5 miles distance from it.

The soundings from Lanawan to the south point of Mataha are various in depth, from 25 to 40 fathoms, but 30 and 35 are the general depths in the fair track. Tamook is in latitude  $6^{\circ} 28'$  N. and longitude  $121^{\circ} 58'$  E. by observations of stars east and west from the moon.

The south point of Mataha is in latitude  $6^{\circ} 32'$  N. and longitude  $121^{\circ} 52'$  E. When abreast, steer to the northward between the Peelas Island, and Ballook Ballook; which is a very good channel, about five miles wide, the depth of water irregular, from 25 to 35 or 40 fathoms; and off the south-west end of Mataha there is 16 and 18 fathoms.

Keep nearer to Mataha than the Peelas in entering this channel, there being some coral spots near the south end of the latter, placed in Mr. Dalrymple's Chart of this Archipelago. Mataha is low, and also the other islands southward from Baseelan, except those mentioned. The north ends of Ballook Ballook and the Peelas are high: the former is of considerable length from north to south, level and low, except the north part. The Peelas is the largest of these islands near Baseelan; its length, from north to south; and is low and even, only on the north part there are two hills. On the east side of Peelas, is a small Island, Toagowloo.

Ballook Ballook is on the meridian of Mataha, viz.  $121^{\circ} 52'$  E. longitude, by objects on each side the moon.

Being past Ballook Ballook, the channel is on the east sides of the Sangboys, and the low Island Teynga, at any distance thought proper. The Sangboys are two high islands; some low land projects out from the hill of the Great Sangboy, which resembles a dome. Teynga is small, and situated on the meridian of the north end of Peelas; it being the northern island of the Soolo Archipelago, in latitude  $6^{\circ} 53'$  N.

#### MALOZA RIVER, BASEELAN.

All the islands are covered with wood, but none of them appear to afford good water; on which account we were necessitated to water at Maloza River, on the south side of Baseelan. The entrance of this river bears about N. N. E. from Tamook, in the eastern part of a bay; and near the entrance of the river are two small

islands close together, one of which is high, and called Gowenen; but is not distinguishable, unless when near, being close to the shore of Baseelan.

The south-east point of the bay has a tope of tall trees on it, between which and the Island Gowenen, is the passage for boats going into Maloza River, which is very shoal at the entrance, there not being depth sufficient for a loaded long-boat, except when near high water; and there seems only one tide in the 24 hours; high water with the moon on the meridian.

The entrance of Maloza River is not perceived until close to it, being narrow; and the trees from each side joining together over it, gives it a gloomy aspect within. A ship should not send for water here, except in case of necessity; and then, if it can be effected, to send two boats well armed. They should not go higher up the river, after the water is observed to be fresh; for going up to the village Maloza is dangerous, owing to the perfidy of the natives.

In March 1793, our long-boat made three trips of water from Maloza; and was on the point of being cut off by the natives of the village; a plan was concerted by them for that purpose. About three years after, the ship Gloucester, of Bombay, lost two boats in watering at this place, and most of the people in them murdered by the native assassins\*.

#### FROM BASEELAN TO POINT BALAGONAN.

In February or March, leaving the north-west end of Baseelan, a ship ought to keep near the western side of Mindano, in passing to the northward; for when the wind is brisk in these months, it is generally from north-east or eastward. The west coast of Mindano is all bold high land, and should be coasted along at a convenient distance, to Point Balagonan, in latitude  $7^{\circ} 51' N.$  longitude  $122^{\circ} 26' E.$  by sun, stars, and moon observations.

#### FROM POINT BALAGONAN TO POINT NASOG, ISLAND PANAY.

Point-Nasog, the southern extremity of the Island Panay, bears from Point Balagonan  $N. 8^{\circ} E.$  distant 52 leagues; but a more easterly course is proper, if the cur-

\* His Majesty's Frigate Sybille lost a boat's crew in Pollock Cove, near Mindano; being unarmed, three of them were murdered by the natives, and the rest, after being in captivity about a year, were ransomed by the humanity of Captain Lynch, and carried by him to Amboyna.



rent sets to the westward, which it frequently does in the north-east monsoon ; running through between the islands to the south-westward.

Steering a direct course from Point Balagonan, towards Point Nasog, if there is any drain of easterly current, Negro's Island will be seen to the eastward ; it is middling high land. The Cagayanes to the westward, are low woody islands, two in number, with some rocks near them, and a shoal, supposed to exist southward from them. The latitude of the Cagayanes is  $9^{\circ} 34'$  N. longitude  $121^{\circ} 26'$  E. by chronometer, from lunar observations. By the same means Point Nasog is in  $122^{\circ} 05'$  east longitude ; and in latitude  $10^{\circ} 27'$  N. This is a high head land, of a pleasant appearance, having two low islands, close to the south-west side of it.

#### FROM POINT NASOG TO THE DRY SAND BANK.

The Dry Sand Bank in the channel, westward from Panay, bears from Point Nasog N.  $11^{\circ}$  W. distant 19 or 20 leagues. By noon observation, when near the Sand Bank, made it in latitude  $11^{\circ} 25'$  N. and longitude  $121^{\circ} 54'$  E. by chronometer, from lunar observations : it is about 5 or 6 leagues from Panay, which is more than one third channel over, from it towards the islands. This Sand Bank is elevated considerably above water, and may be seen about six miles from the deck. The channels, on either side of this Sand Bank, are safe ; that between it and the islands to the westward, is about 10 leagues wide.

#### ISLAND PANAY, AND ISLANDS WESTWARD FROM IT.

Panay, on the west side, is of moderate height near the sea ; and is a rugged and mountainous island ; it is cultivated near the shore, with several towns and churches in view, from the sea, and may therefore be considered well-peopled.

There is a village in a bay, northward from Point Nasog, where wood and water may be procured, but there is probably no anchorage, except very close to the shore. At the distance of  $2\frac{1}{2}$  and 3 leagues from it we got no soundings, in passing along this coast.

On the east side of Panay there is a good harbour, formed between it and the Island Uimaras, where a ship may lie in safety, and obtain supplies, on emergency.

The group of islands, westward from Panay, are of considerable extent; the southern limit, being nearly on the parallel of Point Nasog; and the Island Quiniluban, their northern limit, is in latitude about  $11^{\circ} 28' N.$  distant from the Dry Sand Bank about 11 leagues, bearing nearly W. b. N. from it. These islands are mostly high; there is said to be anchorage among some of them, and some dangers.

A rock, north-westward from Point Nasog, is placed in Mr. Dalrymple's Chart. A Commander of respectability mentions that he saw it in passing, and is about the size of a long-boat.

#### FROM THE DRY SAND BANK, TO THE SOUTH-WEST POINT OF MINDORA.

From the Dry Sand Bank westward from Panay, the southernmost island off the south-west end of Mindora, bears  $N. 39^{\circ} W.$  distance 19 leagues. In running across, on this course in the night, care is requisite to avoid the Caravaos (or Buffaloes) two islands north-westward from Point Potol, one of them very low, and the other high. The latitude of the Buffaloes is about  $11^{\circ} 53' N.$  and bear about N. E. b. E. from Quiniluban, 14 leagues.

When within 6 or 7 leagues of the islands situated near the south-west end of Mindora, haul to the westward, and keep at five leagues distance from them, until their southern extremity bears from E. S. E.  $\frac{1}{2}$  S.; being then clear to the northward of the reef, you may haul in for the Mindora shore. There is a coral bank distant from Quiniluban about five leagues N.  $\frac{1}{2}$  E. and from the southern extremity of the Calamianes about east or E.  $\frac{1}{4}$  S. over which we passed in the night; and had several casts of 22 and 25 fathoms, and then no ground with 80 fathoms. This bank is not projected on any of the charts.

#### CORAL SHOAL, NEAR THE SOUTH-WEST END OF MINDORA.

At a small distance from the south-west end of Mindora, three islands are situated; the westernmost, called Amboylon, is the largest, from which a reef is placed (in the Charts) extending in a S. S. E. direction about five miles. But this reef extends also to the westward from these islands; or there is shoal coral patches in this direction separated from the islands.

Returning from China, in June 1792, steering to the southward, we saw the Coral Rocks alongside; hove in the stays, and had from 9 to 13 fathoms; the low point at the south-west end of Mindora then bore E. N. E.  $\frac{3}{4}$  N. extremes of the islands, off the south-west end of Mindora from E. N. E. to E. b. S.  $\frac{3}{4}$  S. and the body of the south-westernmost island E.  $\frac{1}{2}$  S. distant near three leagues; extremes of the Calamianes from W. to W. S. W.  $\frac{3}{4}$  S. being noon at this time, observed the latitude  $12^{\circ} 13' N.$

After standing four miles to the westward, tacked, and stood back on the edge of the Coral Reef (or Shoal) into thirteen fathoms, then tacked, the southernmost extreme of the islands, off the south-west end of Mindora, bearing E. b. S.  $\frac{1}{4}$  S. and the body of the southernmost island E.  $\frac{1}{4}$  S. about 3 or  $3\frac{1}{2}$  leagues. From thence, stood three miles to the north-west, and saw the rocks alongside on a coral patch; apparently fifteen fathoms water on it, or more; but directly after, when the lead was hove, had no ground with 60 fathoms line; were at this time 4 or  $4\frac{1}{2}$  leagues from the south-west island, that being nearest to us; then the southern extreme of the islands bore E. S. E.  $\frac{1}{4}$  S. northern extreme of them E. b. N.; and the Calamianes from W.  $\frac{3}{4}$  S. to S. W.  $\frac{1}{2}$  W. distant about eight leagues.

It is impossible to assert with precision, whether a large coral reef projects from these islands, to the southward and westward; or if the coral banks are detached patches, separated from the islands and from each other. But it is certain that the edge of the shoal, on which we tacked in 9 fathoms, and afterwards in 13 fathoms, is of considerable extent; for the verge of soundings was visible, from the discoloured water, which appeared shoaler to the eastward upon the bank; but without any broken water.

In standing on the western edge of this bank, from 60 or 80 fathoms, no ground; at the distance of half a cable's length, there are 10 and 12 fathoms, rocky uneven bottom; but uncertain whether there is danger on it, more to the eastward.

There appears to be several coral patches hereabout; that on which we saw the rocks last, was about three miles westward from the edge of the large patch or reef.

To pass clear of these patches, in passing the islands off the south-west end of Mindora, keep at five leagues distance from them; till the southern extremity of them is brought to bear E. S. E.  $\frac{1}{2}$  S. These islands are of moderate height. The south end of the southernmost, is in latitude  $12^{\circ} 08' N.$ ; and longitude  $121^{\circ} 18' E.$  by chronometer and objects on each side of the moon.

## APO BANK, AND ISLANDS CALAMIANES.

Apo is a dangerous shoal, extending nearly nine leagues in length, parallel to the west coast of Mindora, as projected in the charts ; and rather nearer to the Calamianes than to Mindora. By the best authorities, the south end of Apo Bank appears to be in latitude  $12^{\circ} 28' \text{ N.}$  ; and the northern end in  $12^{\circ} 48' \text{ N.}$  In passing, we saw three of the rocky islets, situated on the north-east part of the bank : they are black rocks, and may be seen about three leagues from the deck. When these black rocks on the bank are in sight from the mast-head, bearing about west five or six leagues distant ; the Island Amboyon is then in sight from the deck, open westward from the south-west part of Mindora.

The Calamianes are a group of islands, between the north end of Palawan and Mindora ; the nearest of them, distant about fourteen or fifteen leagues from Mindora, and are mostly high. Busvagon and Coron are middling large, but most of the others, which surround these two, are small islands. The southern extremity of these islands is in about  $11^{\circ} 48' \text{ N.}$  latitude ; and the northern limit  $12^{\circ} 29' \text{ N.}$  and longitude  $120^{\circ} 06' \text{ E.}$

## COURSE ALONG THE WEST SIDE OF MINDORA.

From the southernmost island off the south-west end of Mindora, Point Calavite bears  $\text{N. } 34^{\circ} \text{ W.}$  distance 32 leagues. When past to the northward of the shoal, at the south-west end of Mindora, by having the southernmost island, bearing  $\text{E. S. E. } \frac{1}{2} \text{ S.}$  from five to six leagues ; you ought then to haul in for the shore of Mindora, to give a birth to the south end of Apo Bank, if resolved to pass between it and Mindora. If the wind is easterly, keep within two or three leagues of the Mindora shore : the wind from the westward, do not exceed five or six leagues at most from Mindora ; for the channel between it and Apo Bank appears not more than seven leagues broad.

The west coast of Mindora is a bold shore : no soundings at four or five miles off it. There are several bays, and projecting points of land observed in passing. Near one of the points two small islands are situated. Excepting some of the projecting headlands near the sea, the west side of Mindora is all high land ; but there is a space of level low land forming the south-west end of the island, with some inlets like rivers in it. From the south-west extremity of this low land, the Island Amboyon, two more large islands and a small one, are situated at considerable distance.

Point Calavite is the north-west projection of Mindora, in latitude  $13^{\circ} 28' N.$ ; and longitude, by stars on each side the moon,  $120^{\circ} 28' E.$  Over this point there is a very high mountain, of a regular form, which may be seen at a great distance in clear weather. In April, we experienced land and sea breezes on this coast.

#### FROM POINT CALAVITE TO GOAT ISLAND.

The west point of Goat Island bears from Point Calavite  $N. 24^{\circ} W.$ ; distant nine leagues; this island is low and flat: there is said to be a reef extending out near two miles from its north-west end. It is situated in latitude  $13^{\circ} 51' N.$ ; and longitude  $120^{\circ} 18' E.$  by stars on each side the moon.

The Island Luban is high in the central part, but the north and south points are low: the north point of this island nearly joins the south-east point of Goat Island. The islands southward from Luban are high; and the Island Amul, eastward from it, is a regular shaped high mountain.

#### FROM GOAT ISLAND TO POINT CAPONES.

From Goat Island, Point Capones bears  $N. 3^{\circ} W.$  distance twenty-one leagues. It is a high bluff head-land; and some islets near it, called Capones (or Capons), from which it is named: the outermost is about five miles from the shore, and appears the largest. The latitude of the Point and Islands is about  $14^{\circ} 53' N.$ ; and the longitude of Point Capones, by chronometer measured from lunars,  $120^{\circ} 13' E.$

From Goat Island to Point Capones, the coast of Luconia is high land, with several deep bays in this space; Manila Bay, and that called Subec, being the best and largest. Between these two bays, the land forms a regular high mountain.

#### FROM POINT CAPONES TO CAPE BOLINAO.

Cape Bolinao bears from Point Capones  $N. 2^{\circ} W.$  distant thirty-one leagues; in latitude  $16^{\circ} 27\frac{1}{2}' N.$ ; and longitude  $120^{\circ} 09' E.$  by observations of sun, stars, and moon; and chronometer.

Cape Bolinao is low land, sloping gradually to the extremity, where it rises a little and forms a bluff point: there is a reef of rocky ground surrounding the cape, ex-

tending out to a considerable distance. The projecting part of the land of Point Valinsay, about three leagues southward from Cape Bolinao, is the westernmost part of Luconia, being about two miles west from Cape Bolinao's meridian.

#### WEST COAST OF LUCONIA.

From Manilla Bay entrance to latitude  $15^{\circ}$  N. the west side of Luconia is high and mountainous: here it begins to decrease in height inland; and near the sea, from the latitude  $15^{\circ}$  to  $16^{\circ}$  N. it is not of much elevation.

The Islands Two Sisters, and Adder's Island, are low, and situated further from the shore than represented in the charts: there is said to extend from them a reef to the westward: they have a conspicuous sandy beach; and appear to be in latitude  $15^{\circ} 50'$  N.; and Adder's Island in about  $15^{\circ} 55'$  N.

From  $16^{\circ}$  N. latitude to Cape Bolinao, the land is of moderate height, and even; with a high sandy beach fronting the sea; and the aspect inland, sterile and arid.

In April, from Goat Island, we had land and sea breezes on the coast of Luconia, pleasant weather, and a small drain of current to the northward. Were nine days from Goat Island to Macao, and experienced strong winds from the north-east, in crossing from Cape Bolinao to the coast of China.

The shoals delineated in most charts, at a considerable distance from the coast of Luconia to the westward, are now supposed not to exist: the Scarborough being the only shoal that is known to be situated near the coast, excepting those contiguous to the shore.

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#### IV. CURRENTS IN THE PRECEDING TRACKS.

WHEN the north-west monsoon is strongest, in November, December, January and February, the current from Batavia to the Island Moresses, generally sets to the eastward; at times inclining a little southerly: but the velocity seldom is more than 15 miles in 24 hours.

About the Moresses and south part of Macassar Strait, the current frequently sets to the southward : and in this strait it runs strong to the southward in January, and during the month of February, abating early in March. There is also a weak current, sometimes setting to the southward through the strait, in the southerly monsoon, in June and July ; although the wind from the south-eastward blows into the southern part of the strait about Pulo Laut, at this period.

But at other times, in the southerly monsoon, the current has been observed to set out of the strait to the northward, between Cape Donda and Point Konnccoongan. The currents in Maccasser Strait, and also the winds, may be considered variable during the southerly monsoon.

In October, November, and December, the current frequently sets to the northward, through the strait. And from September to April, or until the westerly winds prevail, the current generally sets from the Pacific Ocean to the westward, or south-west, between Celebes and Mindano.

In passing from Cape Donda to Baseelan, in March, we experienced a constant current to the westward : but on approaching this island, it changed, and set strong to the east-north-eastward for two days ; then suddenly changed, and set south-westward. From Tapeantana to the Peelas, in March, an easterly current prevailed, which slackened at regular times, denoting a kind of tides. When entered the channel, between Mataha and Peelas, a strong tide to the northward was experienced, and a weak one to the southward. At this period very light winds prevailed among these islands.

In the same place, passing in July, experienced tides among the islands, from Teynga until clear of Belan and Tapeantana. In the channel between Ballook Ballook and Peelas, the tide to the southward was strongest. From Mataha to Tapeantana it set nearly north-west and south-east, but strongest to the south-east ; about 2 and  $2\frac{1}{2}$  miles an hour on the springs. At leaving Baseelan, in two days were set 73 miles to the eastward, and 30 miles to the northward, by the current : it then changed suddenly, and set to the westward ; at a mean rate, near 30 miles daily, until we reached Cape Rivers, in July.

There appears to be a kind of tides, which run through between Baseelan and Mindano ; at times strong, at other times weaker and irregular, similar to the tides in the Strait of Sincapour.

In March, from the south-west end of Mindano, along the west side of this island, Panay, and Mindora, experienced very little current, excepting when abreast of the openings between Mindano and Negro's Island ; and between Panay and Mindora, the fresh easterly winds forced a current westward through the channels.

In July, from Mindora, when passing on the west sides of these islands to Baseelan, there was very little current perceived: but at times, a drain to the eastward, when the channels between the islands, leading towards the Pacific Ocean were abreast.

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## V. PASSAGE BY DAMPIER'S STRAIT.

It appears a more eligible track, to enter the Pacific Ocean by Dampier's Strait, or the Gillolo passage, in December, January, and February \*, than by the Strait of Maccasser: for the north-west winds, which are prevalent in those tracks at this time, will enable a ship to get speedily out into the ocean; whereas, she may be retarded in Maccasser Strait, by the strong northerly winds, and currents running to the southward.

Ships from Europe, resolving to pass through any of the straits, eastward of Java, ought, if not in want of refreshments, probably to prefer the Ombay Passage; it being much wider than any of the other straits westward, and generally steadier winds in it. When through the Ombay † Passage, a ship will generally be able to pass on the west side of Bouro, into the Pitt's Passage; and may then proceed into the Pacific Ocean, by the Gillolo Passage, Bougainville's Strait, or Dampier's Strait, as requisite.

By adopting the Ombay Passage, a ship carries steadier winds, and is less liable to intricate navigation, than in passing through any of the straits to the westward, between it and Java.

Ships from Hindostan, acquainted with the navigation of Malacca Strait, may sometimes accomplish a favourable passage to China, through this strait; from hence, on the west side of Borneo, by Salayer Strait; and ultimately into the Pacific, by

\* If February is far advanced, it is rather late to proceed into the Pacific Ocean by Dampier's Strait; probably through the Mollucca Passage, and from thence up the west sides of the Philippine Islands, will be a quicker route to China, than proceeding by the ocean, at this period.

† Between Sandlewood Island and those to the northward, and round the east end of Ombay. If from thence a ship cannot weather Bouro, pass between it and Manippa, or between the latter and Ceram.



**Dampier's Strait, or the Gillolo Passage;** if the passage up the west coasts of Palawan and Luconia is apprehended to be precarious, from bad sailing or otherwise.

But, in times of peace, the track by Sunda Strait is probably to be preferred ; in which case, the subsequent remarks, from Batavia eastward, are apposite.

#### FROM BATAVIA TO CARIMON JAVA.

From Batavia, bound to Salayer Straits in the north-west monsoon ; when clear of Edam, steer a course to pass on the north side of Carimon Java, which bears from Edam, nearly east, 72 leagues. This course carries a ship near Bumkin Island, situated in latitude about  $5^{\circ} 52'$  S. and about 40 leagues eastward from Edam. There is said to be a shoal 2 or 3 leagues northward from Bumkin Island, on account of which, and to guard against E. S. E. currents, if observations are not obtained, it is proper to edge well to the northward in passing along. The depth of water being increased to 25 fathoms, after leaving Edam, you will pass to the northward of Bumkin Island, at a reasonable distance.

Carimon Java is in latitude about  $5^{\circ} 50'$  S. and longitude  $110^{\circ} 36'$  E. by chronometer, from Batavia. It is a high island, with an elevated hill in the centre : there are several small islands about it, one of which is distant about  $2\frac{1}{2}$  leagues to the west-north-westward. About seven leagues north from Carimon Java, we had 32 fathoms in passing.

#### FROM CARIMON JAVA TO THE ISLAND LUBEC.

Lubec bears from Carimon Java nearly east, distant 44 leagues ; in latitude about  $5^{\circ} 49'$  S. and longitude  $112^{\circ} 50'$  E. by chronometer, from Batavia. It is a high island of considerable extent, and should not be approached on the eastern part, there being rocky banks projecting out in that direction, to 2 or 3 leagues distance.

We had 33 fathoms water about nine leagues to the northward of Lubec ; passing along from Carimon Java to Lubec, 32 and 33 fathoms is a good track.

About 12 leagues northward from Lubec, there is a dangerous ridge of rocks very little known. In January 1802, his Majesty's ship *Arrogant* sent her boat upon it, in five feet water, where she could approach with safety : the extent is from north-

west to south-east, a quarter of a mile: the latitude  $5^{\circ} 12' S.$  and longitude  $112^{\circ} 58' E.$  by mean of four chronometers.

#### FROM LUBEC TO THE ISLAND GREAT SOLOMBO.

When past Lubec, steer to pass on the south side of Great Solombo, which bears from Lubec N.  $81^{\circ} E.$  distant 33 leagues, in latitude  $5^{\circ} 33' S.$  longitude  $114^{\circ} 28' E.$  by chronometer, from Batavia: it is low at each end, with a hill on the central part, that may be seen 7 or 8 leagues from the deck.

Passing Lubeck on the north side, at 7 leagues distance, an E. S. E. course will carry a ship about five leagues to the southward of Great Solombo, if there is no oblique current; in soundings from 32 to 36 or 37 fathoms. On approaching Great Solombo, the depth decreases to 20 and 21 fathoms, at 7 or 8 leagues distance, south-eastward from it.

The Little Solombo is about 4 or 5 miles northward from Great Solombo, being a level island of considerable extent. They appear free from danger, and the passage between them is thought to be safe. They are situated on the same meridian, and nearly of equal area.

#### FROM GREAT SOLOMBO TO THE BRILL SHOAL.

The Brill Shoal bears from Great Solombo S.  $84^{\circ} E.$  distant 92 leagues. When past Great Solombo, steer on its parallel, latitude  $5^{\circ} 33' S.$  until 50 or 55 leagues eastward from it; then, according as the channel to be followed, is north or south from the Brill Shoal, an apposite course must be chosen.

The channel on the north side of the Brill Shoal, appears preferable in the north-west monsoon; for in clear weather, the south-west end of Celebes is seen from the shoal: and the islands of Tunikik, being situated about eight leagues northward from it, are a guide to know when past this shoal: whereas, in the channel on the south side of the Brill Shoal, the land is not discernible; consequently no mark perceived, to know when past the shoal, if it is not seen in passing.

If a ship passes on the south side of the Brill Shoal, she ought not to exceed the latitude  $6^{\circ} 16' S.$  on account of the Postillions, which are supposed to be surrounded with dangerous banks.

The northern Postillion Island is about 11 miles west from the meridian of the Brill Shoal ; and the north part of the bank surrounding these islands, is said to be in latitude  $6^{\circ} 25' S.$ ; if so, the parallel  $6^{\circ} 16' S.$  is mid-channel, between this bank and the Brill Shoal.

Passing the Brill Shoal on either side in the night, the latitude should be correctly known.

#### BRILL SHOAL, DE SERRES BANK, TUNIKIK ISLANDS AND SHOALS.

Being on the parallel of Great Solombo, and 50 or 55 leagues east from it, and resolved to pass the Brill Shoal on the south side, edge a little to the south-east, that the latitude may be increased to  $6^{\circ} 16' S.$  when the shoal is nearly approached, if it is not intended to see it: and keeping this latitude in passing, you will be 11 miles from the south end of the shoal, when on its meridian. By observation at noon, the south end of the Brill Shoal bearing W. b. N. made its southern extremity in latitude  $6^{\circ} 05'$ , longitude  $119^{\circ} 00' E.$  or  $4^{\circ} 32' E.$  from Great Solombo, and  $1^{\circ} 28' W.$  from Middle Island in Salayer Straits, by chronometer. By a good view of it from the mast-head, its extent east and west appeared about 4 or 5 miles, and rather greater in a north and south direction: it therefore may be inferred, that the north extremity of this shoal is in latitude  $5^{\circ} 58'$  or  $6^{\circ} 00' S.$  This shoal is dangerous, being situated nearly in mid-channel between the Postillion Islands and Tunikik Islands, and supposed to be steep to, all round. When we passed, there was a regular breaker around the verge of the shoal, having a fresh breeze, and moderate sea at the time. Within the breakers it appeared very shoal, and the water of a light green colour. In smooth weather, there may be little broken water on this shoal; but in day-light, it ever must be easily seen, by its contrast in colour. There is said to be rocks above water, on the north-west part. In 1792, a ship sent her boat on it, and found only two feet water in some places.

This shoal is incorrectly placed in the charts.

If the channel on the north side of the Brill Shoal is chosen, keeping in latitude  $5^{\circ} 48'$  or  $5^{\circ} 50' S.$  is the best track in passing. In these latitudes, about 20 leagues westward from the Brill Shoal, probably soundings may be got, upon the south end of De Serres Bank; said to extend to  $5^{\circ} 49' S.$  latitude, and not dangerous in this part. But further to the northward on this bank, the soundings are irregular, to 6 and 8 fathoms, and is of great extent to the northward, with several small islands on it.

The Island Tunikik, near the south-west end of Celebes, is separated from the latter by a small channel, said to be safe, with soft anchoring ground in it. The latitude of Tunikik is about  $5^{\circ} 31' S.$  On its parallel "Due west from this island 34 miles, is a small island, and 10 miles further, in the same direction, there is another island; and from this last island, in a northern direction, lies a small island more. There is a dangerous shoal which encompasses the two westernmost islands, and projects several miles out to the southward, from the south-westernmost island, trenching to the eastward, till near the easternmost island." On this shoal his Majesty's sloop Swallow, in her voyage of circumnavigation, was in three fathoms coral rocks. In passing along here, a ship must not keep more northerly than latitude  $5^{\circ} 40' S.$ ; as the two southernmost of these islands, by the Swallow's account, are in latitude  $5^{\circ} 31' S.$  with the shoal extending several miles southward, from the southernmost island.

The parallel  $5^{\circ} 50' S.$  seems the best track in running between the Brill and the Tonym Shoals, just mentioned, and also in passing the Boot (or De Serres Bank), for there are probably shoal patches as far southward as latitude  $5^{\circ} 48' S.$  The Ruby, in 1799, August 2d, passed Tunikik Island at 9 A. M. and at 3 P. M. when 47 miles west of it, saw the rocks under the ship: had 10 to 6 fathoms least water; and after running three miles S. W. got off the bank. The latitude was  $5^{\circ} 47' S.$  when in six fathoms. In latitude  $5^{\circ} 48' S.$  the Dedaigneuse frigate had 8 and 7 fathoms coral, from the South Solombo E.  $4^{\circ} S.$  distant 236 miles, and supposed it to be on the Laar (or Boot Shoal), otherwise De Serres Bank; the longitude measured by chronometer.

#### FROM THE BRILL SHOAL TO THE STRAITS OF SALAYER.

Middle Island, in Salayer Straits, bears from the Brill Shoal N.  $75^{\circ} E.$  distant 30 leagues. When past the Brill Shoal, it is prudent to haul in towards Celebes, there being soundings along that shore, from the Island Tunikik, to the east side of Bonthian Bay.

Any discretional distance from the shore may be retained, until a conical hill near the sea, at the bottom of the bay, called Bonthian Hill, is bearing about N. N. E.: must then haul well into the bay, within the shoal, on which the Mansfield had  $3\frac{1}{2}$  fathoms, coral rock, with Bonthian Hill bearing N.  $\frac{1}{2} E.$  distance from the Celebes Shore about  $4\frac{1}{2}$  leagues. In passing it, keep within two leagues of the shore, until Bonthian Hill bears N. or N.  $\frac{1}{2} W.$ ; then haul 3 or 4 leagues from the shore of

Celebes, and steer for the channel between Middle Island and South Island, in Salayer Straits.

From the south-west point of Celebes, along the west side and bottom of Bonthian Bay, the soundings are regular towards the shore; from 8 to 12 fathoms, about 3 or 4 miles distance. And the best anchorage in Boele Comba Road (a Dutch residency) is with the hill N. N. W.  $\frac{1}{4}$  W. and the Flagstaff on the Fort N. N. W.  $2\frac{1}{2}$  or 3 miles, in  $6\frac{1}{2}$  or 7 fathoms, sand and mud. This village affords good water and refreshments for ships, the country being cultivated. Bullocks and sheep may be got, and other articles of provision.

To the north-west, over Boele Comba, the mountain is of astonishing elevation. Bonthian Hill, when first seen, in coming from the westward, appears a little inland; but when abreast, it seems not far from the sea, and is the only conical hill about the bay, near the shore. If a ship from the south-west end of Celebes, intends to pass southward of the Mansfield's Shoal, she ought to keep 7 or 8 leagues distant from the Celebes Shore, when Bonthian Hill bears from N. b. E. to N.  $\frac{1}{2}$  W. If the hill is not seen, should keep in latitude about  $5^{\circ} 52'$  S. till within five leagues of Salayer; then haul to the north-east, to pass between Middle and South Islands. The Mansfield Shoal is supposed to bear nearly west from South Island, distant 6 or 7 leagues.

#### STRAITS OF SALAYER.

It has been observed, that the channel within the Mansfield Shoal, is preferable to that southward of it, in the north-west monsoon. And in adopting the Inside Channel, it may be proper to adhere to the subsequent remarks, for avoiding some coral patches in the east side of Bonthian Bay, not generally known.

The west side, and bottom of Bonthian Bay, being safe, with good soundings for anchorage near the shore, steer along this part of the bay, at from 4 to 6 miles off shore, until Bonthian Hill is brought to bear N.  $\frac{1}{2}$  W.; being then past the Mansfield's Shoal, edge to the southward, and increase the distance from the shore to 4 or 5 leagues, before Bonthian Hill is so far westerly as N. W. b. N. or before the islands in Salayer Strait are all boldly in sight from the deck. Or as soon as Middle Island is discernible from the quarter deck, edge out until it bears E. b. N. to pass without two coral banks, one bearing west from Middle Island, and the other W. b. N. from it about 4 leagues, and 6 or 7 miles from the shore of Celebes. The ship Thomas had  $7\frac{1}{2}$  fathoms on this coral patch, with Bonthian Hill N. W.  $\frac{1}{2}$  N. and Middle Island E. b. S.  $\frac{1}{2}$  S.; and the ship Amboyna, with Middle Island east,

put her helm down, and tacked close to breakers, with one rock even with the water's edge. This shoal is circular and about half a mile in extent: when it bore south half a mile, the Flagstaff of Boele Comba bore N. W. 9 or 10 miles distant.

There is no passage between Salayer and South Island; a Dutch ship was lost in attempting to pass through. It appears to be rocky between North Island and Celebes; a Dutch officer, of experience, asserts that there is no safe passage this way.

The channel between North Island and Middle Island has been considered safe, without any soundings; but the channel between Middle and South Islands is wider and preferable; for it appears there is one, or more, coral banks in the north channel, by the ship Amboyna's soundings. February the 10th, 1800, this ship had  $8\frac{1}{2}$  fathoms rocks, when Middle Island bore south (the centre), distant about  $2\frac{1}{4}$  miles, and in three casts deepened to 55 fathoms.

It therefore appears, that the channel on the south side of Middle Island is the most eligible, in passing between Salayer and Celebes.

The south point of Celebes, opposite to Salayer, is of middling height, and covered with trees; and the concavity of Bonthian Bay, low near the sea. In coming from the westward, if far off shore, North Island is on with the south point of Celebes; but when to the eastward, a wide space appears between them. These three islands, between Celebes and Salayer, are rather low: they may be seen about five leagues from the deck. The north end of Salayer is rather higher, and when first seen either from east or westward, also resembles an island; the low neck of land joining it to the body of Salayer, being then below the horizon. The Island Salayer is cultivated; of a pleasing aspect, and moderately elevated: the north point is in latitude  $5^{\circ} 50' S$ .

Extending parallel to Salayer, at a small distance westward from it, Verkin's (or Hog) Island is situated, a low island of considerable length. On the west side of this island, is a shoal called by the Dutch Hotland's Rudson; it is said to be in length, east and west, a quarter of a mile, having two fathoms sharp rocks on it, in some places. From its shoalest part, the south end of Salayer bears S. b. E. on with Hog Island, and the north end of Salayer N. N. E.; and it is about five miles distant from Hog Island.

When Middle Island bore west, observed the latitude  $5^{\circ} 40' S$ . and by chronometer from Batavia, and lunar observations, made it in longitude  $120^{\circ} 28' E$ .

## FROM MIDDLE ISLAND TO BOUTON SOUTH POINT.

The south point of Bouton bears from Middle Island, in Salayer Straits, about E.  $2^{\circ}$  S. ; a course E.  $\frac{1}{2}$  S. (if no oblique current) will lead a ship fair along to the southward of the Island Cambyna and South Island, at a reasonable distance from both.

Cambyna is very high, with a central peak ; the latitude of the south end is  $5^{\circ} 31'$  S. The peak, in about  $5^{\circ} 21'$  S. and longitude  $122^{\circ} 01'$  E. or  $1^{\circ} 33'$  E. from Middle Island, by chronometer. There are two islets off the south-east but of Cambyna.

South Island bears nearly west from the south end of Bouton, about 12 miles : is of moderate height, and on with the south part of Bouton in coming from the westward, by which it is not perceived to be an island, till near. The latitude appears to be about  $5^{\circ} 43'$  S. and longitude  $122^{\circ} 32'$  E. or  $2^{\circ} 04'$  E. from Middle Island, by chronometer.

Hegadis Island is in latitude about  $6^{\circ} 13'$  S. and in longitude  $122^{\circ} 42'$  E. by chronometer. It bears nearly south from the south point of Bouton, and is of moderate elevation.

## ISLAND BOUTON.

The southern point of Bouton is in longitude, by chronometer and lunar observations,  $122^{\circ} 44'$  E. and the latitude is about  $5^{\circ} 42'$  S. which is more northerly than it is placed in the charts. Bouton is of middling height, the south part hilly with much wood. Both it and Cambyna are cultivated, and lights generally seen on them, when passing in the night. The south and south-east sides of Bouton are steep to, and no soundings to be got until close to the shore. When a ship has reached the south-east part of Bouton, in the north-west monsoon, she should keep within 2 or 3 leagues of the shore, or nearer, if the wind is from the westward. Captain G. Seton was delayed on the east side of Bouton, by variable light winds and southerly currents, from the 23d of February to the 6th of March, and found the eastern shore steep to ; trying frequently in different places for soundings, when within a mile of the shore, but got no ground with 100 and 120 fathoms of line. Several other ships have made the same observations on the eastern coast of Bouton : notwithstanding, there is said

to be a shoal near the shore, on the east side of Bouton, supposed to be in about latitude  $5^{\circ} 30'$  S. but it seems very doubtful.

The east point of Bouton is in latitude  $5^{\circ} 15'$  S. and longitude  $123^{\circ} 15'$  E. by chronometer; it is a level low point projecting into the sea, and bears west from the nearest large Island Token Bassias. From the east point of Bouton the land takes a direction to the north-westward, by which a deep extensive bay is formed between it and the north-east part of the island: this bay is above nine leagues wide, the north point of it bearing about N. b. W. from Bouton East Point. In passing along, a direct course may be steered from point to point, as few ships have navigated in this bay. There is however, in the northern extremity of it, a road, or kind of harbour, which is formed by the north point, and some sand-banks projecting from it to the southward. A Dutch ship, bound to the Spice Islands, at the approach of the south-east monsoon, took shelter in this harbour during the monsoon, and mentions moderate depths for anchorage in the north part of the bay, where rice, poultry, &c. may be procured.

It appears from the Plan of this harbour, constructed in the Dutch ship, that care is requisite in going in, on account of the banks which secure it from the sea, but render it safe when once in.

The north point of this bay is even land, and continues level near the sea, for a considerable distance to the northward; which may be coasted along at an eligible distance to the north-east end of Bouton: this is in latitude  $4^{\circ} 23'$  S. and longitude  $123^{\circ} 04'$  E.

#### ISLANDS WEYWONGY AND WAXWAY.

Weywongy is a high island to the northward of Bouton: the body of it appears to be in latitude  $4^{\circ} 03'$  S. Between this island and the north part of Bouton, is the north entrance of Bouton Strait: a ship of 600 tons lately passed through them, but they are now seldom frequented, the track on the east side of Bouton being preferred.

The Island Waxway, northward from Weywongy, is elevated in the centre, with a declivity at the extremes: the centre of this island is in latitude  $3^{\circ} 34'$  S. longitude  $123^{\circ} 14'$  E.



## FROM WEYWONGY TO XULLA BESSEY.

When a ship has reached the north end of Bouton, and the wind from north-westward, it is prudent to steer on to the northward, and approach near Weywongy; then stretch across from it to the south part of Xulla Bessey. From Bouton to Dampier's Strait, a precaution is requisite, on account of southerly currents often prevailing, to keep nearest the northern side of the channel in passing along, particularly if the wind inclines from the northward.

## TOKEN BASSIAS, OR TOKEN BESSEYS.

These are a group of islands to the eastward from Bouton, of considerable extent north and south: the westernmost island, and nearest to Bouton, appears to be the largest and highest, and may be seen from the deck about seven leagues; the centre of it is in latitude  $5^{\circ} 15' S.$  and the west part of it in longitude  $123^{\circ} 36' E.$  which leaves a channel of seven leagues between it and the east point of Bouton. It has generally been supposed, that dangerous banks project from these islands, to a considerable distance all round. This appears not to be the case, for several ships have recently passed along the north sides of the two northernmost islands, at the distance of 3 or 4 miles, and saw no danger; they abound with cocoa-nut trees, seem to be inhabited, and are probably safe on the northern sides.

It is, however, imprudent to make too free with this group of islands until better known, particularly near the southern part. It seems that a ship grounded lately on a shoal, in latitude  $5^{\circ} 30' S.$  said to be near the north-east shore of Bouton, the north point of this island bearing  $W. \frac{1}{2} N.$  But from the extract, it may be inferred, that they grounded on the east side of Token Bassias, mistaking these islands for Bouton.

## XULLA BESSEY AND BOURO.

The south point of the Island Xulla Bessey, is in latitude  $2^{\circ} 28' S.$  and in longitude  $125^{\circ} 58' E.$  by chronometer, and lunar observations. This island is of moderate elevation, and even appearance, and thought to extend more northerly than represented in the charts. There is a village at the south-east point, near the sea.

The north-west end of the island Bouro bears from the south point of Xulla Bessey S.  $2^{\circ}$  W. distant about 14 leagues; this being the breadth of the channel between them: and is in latitude  $3^{\circ} 06'$  S. and longitude, by chronometer and lunars,  $125^{\circ} 56'$  E. Bouro is all high land, the north-west part highest; on which is a semi-circular mountain, resembling a dome, which may be seen at twenty-five leagues distance in clear weather.

The north-east part of Bouro, at the north side of the bay, appears to be in longitude  $126^{\circ} 58'$  E. by chronometer.

#### FROM XULLA BESSEY TO THE ISLAND GOMONA.

Gomona bears from the south point of Xulla Bessey N.  $71^{\circ}$  E. distant 34 leagues; in about latitude  $1^{\circ} 55'$  S. and longitude  $127^{\circ} 34'$  E. by chronometer; and appears, when seen at a distance, from the eastward or westward, like two small islands. Oby Major, to the northward, is high land.

#### FROM GOMONA TO PULO PISANG.

From Gomona Pulo Pisang bears N.  $68^{\circ}$  east, distance 24 leagues, in latitude about  $1^{\circ} 28'$  S. and longitude by chronometer  $128^{\circ} 40'$  east. It is a high saddle island, with an islet near its eastern side.

On the north side of the channel, between Gomona and Pulo Pisang, several small islands extend nearly in the same direction. The westernmost, Pulo Gaysses, is situated about 14 leagues E. N. eastward from Gomona; a flat regular sloping island. The Island Lawn is  $3\frac{1}{4}$  or 4 leagues from Pulo Pisang, about W. b. S. and Kekik two leagues westward from Lawn, with a small island between them: they are all high small islands. The distance between Great and Little Gaysses is greater than represented on the charts. The high rugged Island Bonoa, situated northward from the north-west point of Ceram, is in longitude  $127^{\circ} 48'$  E. the latitude about  $2^{\circ} 53'$  S.

#### FROM PULO PISANG TO PULO POPO.

The south end of Pulo Popo bears from Pulo Pisang N.  $76^{\circ}$  E. distant about 21 leagues; there is a group of small islands, called Boo, (or Esplie) situated between.

them ; but nearest to Popo, and nearly west from it : there is said to be soundings and anchorage amongst some of them. To the northward of Pulo Popo there is a safe channel ; also to the westward from it, through the channels between it and Oby Major, ships may pass into the Gillolo Passage, formed by Gillolo to the westward, and Wageeooe (or Wegecooe) to the eastward, having Geby and many other islands in it. The channel, between Gillolo and Geby, is generally called the Gillolo Passage ; and between Geby and Weyoogee, Bougainville's Strait : and to the westward of Gillolo, between it and Celebes, the Molucca Passage.

#### PULO POPO AND KANARY ISLANDS.

Between the south end of Pulo Popo and the Kanary Islands, is the narrowest part of this track, from Bouton to Battanta, generally called the Pitt's Passage ; and is here about 9 or 10 leagues wide. In this part, to the southward, the Island Mysole is situated ; which is level and of moderate height, and on the north side enveloped by the group of islands, called Kanary ; the northernmost of these bounding the channel to the southward.

There is said to be good anchorage amongst some of the Kanary Islands ; and the westernmost is the largest, called Grand Kanary. It is supposed to be in latitude  $1^{\circ} 44'$  S. and 5 or 6 leagues westward from Pulo Popo's meridian.

Pulo Popo is about five leagues in length east and west, including the small islands contiguous to its west end ; and about three leagues in extent north and south. This island is very conspicuous, having two hills near the north-west part, one of them semicircular like a bee-hive, and the other oblong. The eastern part of the island is level and low. The latitude of the south point of this island, is about  $1^{\circ} 12'$  S. and longitude  $129^{\circ} 49'$  E. by chronometer, from Batavia. Several islets appear close to Pulo Popo.

#### FROM PULO POPO TO DAMPIER'S STRAIT.

When past Pulo Popo to the eastward, the high land of the Islands Battanta and Salawatty are discernible, which are both considerably elevated.

From the south-east point of Pulo Popo, the entrance of Pitt's Strait bears E. N. E. and Fisher's Island, adjacent to Cape Mabo, bears from it N.  $57^{\circ}$  E. distant 14 or 15 leagues. This island bears W.  $\frac{1}{2}$  N. from Cape Mabo, distance about two miles.

Cape Mabo is the west point of Battanta, situated in latitude  $00^{\circ} 56'$  S. and by chronometer, from lunar observations, in longitude  $130^{\circ} 25'$  E. and Fisher's Island near it, in latitude  $00^{\circ} 55'$  S. and longitude  $130^{\circ} 23'$  E. The entrance of Dampier's Strait is on the north side of Cape Mabo; and southward from it is the west entrance of Pitt's Strait, formed by Battanta and Salawatty.

#### DAMPIER'S STRAIT.

The Island Battanta bounds Dampier's Strait on the south side, and Weyoogee on the north side. There are several islands in this strait; Gammen is the largest, situated near Weyoogee, on the south side, and appears as part of it. King William's Island is high, and situated near the middle of the strait: when viewed at a distance from the eastward, three hills on it appear like three islands. The passage is to the southward of this island; also southward of two small low islands, called Augusta and Pigeon Islands; which are situated at a considerable distance from the west end of King William's Island to the southward. Augusta is the westernmost island of these two.

Fowl Island is level and small, lying between the east end of King William's Island, and the north shore of Battanta, but nearest to the latter. The proper channel is between the islands mentioned, to the northward; and Fowl Island to the southward.

Due east from Fowl Island, there is a white sand bank, part of it covered with tall trees: this is called Mansfield Island; which is on the south side of the strait. Within it there are, near the Battanta shore, some small islands scarcely to be distinguished from the shore.

There are several islands close to the Weyoogee shore, and one off the east end of King William's Island, called Hum. The island Battanta is about 13 leagues in length, from east to west.

There is deep water close to King William's Island, on the south side; and it is supposed that the south shore of Weyoogee is safe. It has been asserted that a ship approached close to the Weyoogee shore, (a few years since) and got some refreshments at a village, inside of King William's Island.

Departing from the east end of Pulo Popo, if the wind is northerly, haul up N. E. or N. E. b. N. to be sure of fetching into Dampier's Strait: or even a more northerly course may be sometimes requisite, if the current is perceived to run strong to the southward: but you must be guided in the course, by the direction of the winds and currents hereabout. There is a chain of low islands about 8 or 9 leagues distant from Cape Mabo, to the westward; which ought not to be approached in steering across for Dampier's Strait, until they are better known: they are avoided by keeping nearest the western shore of Battanta, which is clear of danger.

When past Fisher's Island, three or four leagues to the north-eastward, there are soundings along the Battanta shore; which ought then to be coasted along, at 3 or 4 leagues distance at most. To the westward of Augusta Island, there are some coral patches, not well known: on one of these the Augusta had four fathoms, with the Island Augusta bearing about E. b. N. distant two leagues. On another patch, the Mansfield had six fathoms, Augusta Island bearing about E. N. E. 4 miles; and it is probable there may be less water on some of these patches.

The soundings are irregular from 30 to 60 fathoms, until 2 or 3 miles from Pigeon Island. Here is a bank extending eastward from this island four or five miles, with moderate depths on it for anchorage, the bottom mostly sand and gravel. There is  $5\frac{1}{2}$  fathoms coral rock, with Pigeon Island W. b. S.  $1\frac{1}{2}$  miles; but deepens to 10 and 12 fathoms sand, when 3 or 4 miles eastward, from this island. To the northward the water deepens fast towards the east end of King William's Island; there being no ground at one mile distant from it, with 90 fathoms line. Also from the bank, east of Pigeon Island, the depth increases fast in the south part of the channel, towards the reef surrounding Fowl Island. This is called Vansittart's Shoal, and extends out from the north side of Battanta to a considerable distance.

Vansittart's Shoal is thought to represent in shape a right-angled triangle; the north shore of Battanta being the hypotenuse, and Foul Island near the right angle: this island being about three miles from the north-west angular point of the shoal, upon it; or about three miles south-east from the north-west extremity of the shoal. From this angular point, the western verge extends directly southward to the shore of Battanta; and from the same point, on a line directly east, the northern verge of this shoal extends towards the east end of Battanta; having Mansfield's island on the northern edge.

From Fisher's Island, coasting along the west side of Battanta, at three or four leagues distance, and Augusta Island brought to bear about N. E. b. E. should then edge over towards it and Pigeon Island, to give a birth to the north-west angle of

Vansittart's Shoal, by not approaching nearer to Fowl Island than five or six miles when it bears east ; nor within four miles, when it is to the southward. The Islands Augusta and Pigeon may be passed at a moderate distance, as the coral flat does not extend far out to the southward from them. There is a channel between these two islands, but it is narrow and intricate. Augusta is the easiest for landing on, to cut wood ; but, on the ebb tide, care is requisite, to prevent boats from receiving injury on the sharp coral rocks.

If Mansfield's Island is discernible, by keeping it on with the south part of Fowl Island, a ship will pass clear to the southward of the shoal patches, which were passed over by the Mansfield and Augusta : and when within three miles of the latter island, pass on the south side of them, at any convenient distance.

When Pigeon Island bears west from three to five miles, you will have soundings 10 or 12 fathoms ; but in borrowing over towards Fowl Island, the water deepens to 60 fathoms irregular soundings ; close to the north-west angle of Vansittart's Shoal, the verge of which is thought to be steep and dangerous.

When Fowl Island bears south or S. b. E. there are no more soundings : but be careful to keep to the northward of a strait line joining Fowl and Mansfield Islands ; for that line is on the edge of the shoal.

When past Fowl Island, steer direct for Point Pigot. Several small islands are perceived close to the Weyoogee shore, in passing ; and some inlets, like rivers, appear. If the wind is from the northward, keep near the point, in passing out from the strait, that a reasonable distance from the shore of New Guinea may be preserved.

Point Pigot, the south-east extreme of Weyoogee, is moderately elevated, with two small islands at a small distance from it. The latitude of this point is about  $00^{\circ} 21' S.$  and longitude  $131^{\circ} 18' E.$  by sun, stars, and moon. The passage between Point Pigot and New Guinea is about eight leagues wide : this north-west end of New Guinea is low ; but when a few leagues east from Point Pigot, all the land, on the north coast of New Guinea, is high and mountainous. In some charts the Cape of Good Hope, on New Guinea, is placed too far to the northward. It is in latitude  $00^{\circ} 21' S.$  on the parallel of Point Pigot, and is distant from it 21 leagues. There is said to be soundings along the north coast of New Guinea, within 3 or 4 miles of the shore, as far as Dory Harbour : but none at two or three leagues distance.

#### YOWL ISLANDS.

These are a chain of low islands, situated about 10 leagues from the north side of Weyoogee ; extending nearly in an east and west direction : the five easternmost islands

comprehend a space about five leagues, environed with a continued chain of rocks and breakers; without any apparent passage between them \*; and having an extensive reef to the northward of them. The easternmost (or southernmost) of these five islands is in latitude  $00^{\circ} 26'$  N. and 20 miles west, from the meridian of Point Pigot, by chronometer. There is another island by itself, about nine leagues westward from the group just described. Captain Seton passed out from Dampier's Strait, and got as far eastward as the Cape of Good Hope; light winds prevailing, being then the first of April, was horsed by a strong westerly current within  $2\frac{1}{2}$  miles of the southernmost of these islands; and got no soundings at this distance. The natives, Papoas, came near the ship in their canoes. After being carried to the westward of these islands, with a westerly breeze, he made the shoal near Lord North's Island, called by him Helen's Shoal, on the 5th of April. From thence was 20 days to the Bashee Islands, having got the north-east monsoon in latitude  $6^{\circ}$  N. He passed to the westward of the Pellews, and saw St. André Islands.

#### TIDES IN DAMPIER'S STRAIT.

The tides in this strait, generally speaking, are irregular; but frequently strong. Between Pulo Popo and Battanta, in the south-east monsoon, there is often a current setting to the northward; but, at times, there is no current. In the north-west monsoon, from September to April, the prevailing current is southerly; although, at times, it may be liable to deviations.

Between Point Pigot and New Guinea, the tide appears to run sometimes 12 miles in and out; but the tide setting to the eastward, is generally the strongest in this part, in both monsoons.

In the narrow part of Dampier's Strait, between Fowl Island, and Augusta and Pigeon Islands, the tide to the south-west, appears to be the strongest, in the southerly monsoon, and continues to run longer than the tide out of the strait.

In July and August, at anchor, about four miles eastward from Pigeon Island, the tide to the eastward has been observed seldom to run longer than five hours; often

\* In Captain Forrest's Plan of these islands, a kind of harbour, or *baron*, is delineated among them: the Lord North is said to have watered here in 1782; but the approach to them must certainly be dangerous, from the extensive reef which envelopes them, having no soundings near it.

weak, with a long interval of slack water : but, at other times, its velocity for a short time, when strongest, has been from  $4\frac{1}{2}$  to 5 miles an hour.

At the same times and place, it has been observed that the tide, to the westward, frequently runs 10 and 11 hours ; gradually augmenting in strength in the first part, setting about W. S. W. from thence S. W. b. S. when strongest, about five miles an hour, or a little more on high spring tides, and about four miles on the neaps : after running strong S. W. b. S. to S. W. for a few hours, it abates gradually, until it changes and runs to the eastward.

### PITT'S STRAIT.

This Strait is narrow, with rapid tides and strong eddies in it : the preference at present is generally given to Dampier's Strait ; and the former only used in cases of emergency.

In crossing from Pulo Popo towards Battanta, it sometimes happens when the wind is light, and a current running to the southward, that ships cannot pass to the northward of Battanta into Dampier's Strait, and are then obliged to pass through the Pitt's Strait.

A ship, necessitated to adopt this route, should endeavour to keep in the middle of the Strait\* until near the east end of Battanta : it is then proper to haul over towards Jackson's Island, to give a birth to the reef, projecting out from the east end of Battanta. There is  $3\frac{1}{2}$  and 4 fathoms in some parts of this reef, but a greater depth on its outer edge ; whereby a ship may anchor, if the tide is carrying her towards the shoal parts of the reef. There is no soundings in this strait, except on a small bank close to the Salawatty shore, eastward from Regewin island. Several ships have anchored on this bank ; but it is improper to anchor in this strait, if it can be avoided.

Regewin Island is small, and situated near the Salawatty shore, at the west-end of Pitt's Strait. Jackson's island is high, and lies near the north-east end of Salawatty ; at the north part of Revenge's Strait. This is sometimes called Watson's Strait : it is formed by the Island Salawatty on one side, and the shore of New Guinea on the other, having many islands in it, and appears to be an intricate passage.

\* Some ships have been thrown by the eddies against the north shore of Salawatty, their yards touching the trees, and apprehended great danger.



When a ship has passed through Pitt's Strait, and is to the eastward of the reef, at the east end of Battanta, she should steer over towards Point Pigot, if the wind is northerly, to avoid the New Guinea Shore.

It may be observed that the natives, inhabiting the west coast of New Guinea, are a race of men of savage aspect. They are perfidious and cruel, which makes it very dangerous to send boats on shore, to look for water, or otherwise, on this coast. Small vessels should not permit too great a number of canoes to come along side: they generally carry bows and arrows with them in the canoes.

In Dampier's and Pitt's Strait, the perpendicular rise and fall of the tides is about 10 or 12 feet, at the full and change of the moon.

If a ship passes between Weyoogee and Gillolo, she may conveniently water on the south-west side of the Island Geby, which is situated between the east point of Gillolo and the former island. Here a snug harbour is formed within a small island, called Isle Faux, by the French ships *L'Isle de France* and *Necessaire*, where they remained some time, and made a survey. Lieut. M<sup>c</sup>Cluer also refreshed here, and speaks favourably of the natives, who are Mahomedans. The south point of Isle Faux, and south entrance of the harbour, are in latitude  $00^{\circ} 10' S.$ ; the best passage into the harbour is on the west side of two reefs, which are situated in the entrance.

To the eastward of these, is a bay with safe anchorage close to the Geby shore. The north entrance into the harbour is narrow, with a reef in it: at this place is the rivulet of fresh water, on Geby. There is no anchorage on the north-east side of the island. There is anchorage and fresh water on the west side of Pulo Syang, according to Captain Forrest. This island is north-eastward about 12 leagues from Geby, and is low and flat.

The harbour formed inside of Pulo Rawak, and that called Offak, on the north coast of Weyoogee (or Waygiou by Captain Forrest) appear, by his plans of them, to be safe; and a supply of fresh water easily obtained.

## NAVIGATION FROM CHINA BY EASTERN PASSAGES.

### I. ON THE WEST SIDE OF THE PHILIPINE ISLANDS.

A ship has been known to take her departure from the Grand Ladrone in May, and reach Singapour Strait in five weeks, by a direct passage down the middle of the

China Sea. Had she passed along the coast of Cochin China, probably the passage would have been more speedy.

If a ship leaves Canton River in May, or early in June, bound to Hindostan, and is an indifferent sailer; difficulty may be apprehended, in adopting the route by the coast of Cochin China towards Malacca Strait, or to the westward of Borneo. In this case, if it is near the latter end of April before she departs from the Grand Ladrone, the passage on the west side of the Philippine Islands, and by Maccasser Strait, may be chosen.

At leaving the Grand Ladrone, bound for the Mindora Passage, a ship ought to get to the southward, or south-westward if possible, for three or four degrees: for a ship, by getting to the Macclesfield Bank, may be enabled to reach Mindora on the starboard tack, with a south-west wind.

When reached the latitude  $16^{\circ}$  or  $15^{\circ}$  N. she ought to stand to the south-eastward upon a wind: for although unable to weather Point Calavite, the winds will be experienced variable on the coast of Luconia, especially about the south-west part, to enable a ship to get round the north-west end of Mindora. Whereas, two or three degrees off the coast, the winds are often fixed at south, and S. S. E. light and baffling, during the month of May, and early in June.

#### BETWEEN APO BANK AND THE CALAMIANES.

If the wind is from the westward, and near the north end of Calamianes, it will be more direct, to pass between these islands and the Bank Apo, than to steer over towards Point Calavite, for the channel between the bank and Mindora.

The channel between the easternmost small Calamian Islands and Apo Bank, is about five leagues wide: these islands are bold to stand to, which is the proper side of the channel, with the wind from the westward.

When the south end of Calamianes bears west, distant about six leagues, the Island Quiniluban will be seen, if the weather is clear, bearing S. b. E. or S. S. E. six or seven leagues: if the wind is from the westward, borrow within four or five leagues of it; to be enabled to pass on the west side of the dry sand-bank, in latitude  $11^{\circ} 25' \cdot N.$ ; then proceed along the west side of Panay, at any convenient distance that the wind may require.

If a ship passes through the channel, between Apo Bank and Mindora, it is proper to keep about five leagues from the islands, at the south-west end of Mindora, when the southern extremity of them bears from E. S. E.  $\frac{1}{2}$  S. to E. N. E.

In the latter part of June, we experienced land and sea breezes on the west coast of Panay, but not regular.

#### FROM PANAY TO THE SOUTHWARD.

At leaving Point Nasog, in June or July, a ship should steer to the S. S. W. if the wind will permit, on purpose to make the coast of Mindano well to the southward, should the wind incline westerly; but, with an easterly wind, a course from Point Nasog direct to Point Balagonan is proper.

In crossing from Panay to Mindano, late in June, had fresh westerly winds, cloudy weather and rain, until we reached the south-west end of this island: then clear weather commenced, and variable winds from the southward. From Mindora to Baseelan experienced no current, except a small drain at times, to the eastward.

#### FROM BASEELAN TO THE STRAIT OF MACCASSER.

Being at the south-west end of Mindano, the channel between it and Baseelan is preferable to any of those southward of this island, it being a much shorter route, although not so fit for anchorage, as the channels southward from Baseelan.

From the island Baseelan, steer such a course towards the north entrance of Macassar Strait, as the prevailing winds and currents may render expedient. When the strait is nearly approached, and the wind steady from the westward, it may be prudent to make Point Konneecoongan; to be enabled to enter the strait with the westerly wind. But should the wind be fresh from the eastward, Cape Donda bearing south or S. S. E. when first seen, probably may be the most proper land-fall.

At all events, the land should not be made far eastward from Cape Donda, in June and July; for the current often sets out of the strait to the eastward; which may greatly retard a ship in entering the strait, particularly if the wind continues from west or south-westward.

June 30, 1792, we left Baseelan with a moderate breeze, at south-west: it shifted on the day following, and continued between E. N. E. and S. until close to Cape Rivers, on the 7th of July. It then became variable from west to south-west.

During the first three days from Baseelan, experienced a current of 17 leagues to the northward, and 33 leagues to the eastward; and was carried in sight of the Volcano on Mindano. The ebullition of the water was great, with strong eddies and foam, owing to the rapidity of the current. On the third day it changed, and set strong to the westward. On the fourth and fifth day, after leaving Baseelan, it set at the rate of thirty-seven miles each day to the westward, inclining a little to the southward on the fourth, and to the northward of west on the 5th day. It became weak on the two following days, and set in a north-west direction, with a velocity of 15 miles in 24 hours. At Cape Rivers experienced a current setting to the north-eastward, out of the Strait of Maccasser.

#### MACCASSER STRAIT.

Having entered this Strait, in June or July, proceed to the southward, as the winds will permit, till in latitude  $1^{\circ} 30' S.$ ; then the Borneo shore ought to be coasted along at a moderate distance; but on no account whatever, should the latitude be increased above  $1^{\circ} 50' S.$  until the coast of Borneo is approached, within five or six leagues, and must be continued, at a near distance, in passing between it and the Little Pater-Nosters.

The winds are variable in the Strait of Maccasser, at this period, generally from the westward, or southward, and the current also changeable. In the southern part of the Strait, off Pulo Laut, the winds, at this season, are often steady between south and south-east; but a drain of current setting frequently to the southward here, favours a ship in getting round the south end of the island. When this is accomplished, a ship may, with the easterly winds, stand to the southward, and pass through the Strait of Allass, into the ocean: or from the south end of Great Pulo Laut, steer direct through the Java Sea for Sunda Strait, where a fresh steady monsoon from the eastward prevails; and clear weather, at this season.

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#### II. ON THE EAST SIDE OF THE PHILLIPINE ISLANDS.

A SHIP which sails indifferently, and departing from Canton River in June or July, bound to Hindoostan, will probably meet with less embarrassment, and have a more

favourable passage, in proceeding to the eastward of Luconia; and, ultimately, through Dampier's Strait, and the Pitt's Passage, than by any other route; but in August it is rather late for this passage: a ship leaving China in this month ought to adopt the route along the coast of Cochin China, Cambodia, and Tringany, to Sincapour Strait; although the winds are generally unfavourable, this passage may be accomplished in a month or five weeks, with a tolerable sailing ship.

In June or July, departing from Canton River, steer direct for the Bashee Islands; and may pass through the channel on the north side of them, or that to the southward; as seems most expedient: then steer to the southward between the Pellew Islands and Philipines; where variable winds prevail, but mostly from the westward at this period.

When past the Pellew Islands to the southward, it may be proper to keep in longitude about  $132^{\circ}$  to  $133^{\circ}$  east, when approaching near the equator, for the winds are prevalent, from south-east and eastward, about this situation, especially for two or three degrees to the northward of the equator; but about Point Pigot, and along the coast of New Guinea, near the shore, the wind appears to blow mostly from the westward, at this season.

On account of this difference of the wind, near the Coast of New Guinea, it may be prudent for a ship to be in longitude  $132\frac{1}{2}^{\circ}$  or  $133^{\circ}$  east, when she has reached the latitude  $2^{\circ} 00' N$ . if the wind is then from east or south-eastward. From this situation steer direct for Point Pigot; inclining a little to the eastward, if the wind blows steady and fresh from that quarter; but do not make the Coast of New Guinea, far to the eastward of Point Pigot; for in this case, a ship may be retarded several days before she can enter Dampier's Strait, by south-west or westerly winds, particularly if the current inclines to set to the eastward, which sometimes happens at this season.

#### DAMPIER'S STRAIT.

There is no danger in running in between Point Pigot and New Guinea in the night, the distance to the north part of Vansittart's Shoal being about 12 leagues westward from Point Pigot, and King William's Island bears nearly west from it: therefore, by entering between this Point and New Guinea in the night, and steering to the westward for King William's Island, the narrow part of the Strait, between Vansittart's Shoal and the islands to the northward, will probably be passed on the following day, if the wind is favourable.

It is requisite, before stretching across for Pulo Popo, to work close round Battanta

to Fisher's Island, on purpose to make certain of weathering Pulo Popo, with a south-east wind, and northerly current, which often prevail in this monsoon. Some ships, by not taking this precaution, have found it difficult to work round Pulo Popo; and to prevent a loss of time have passed to the northward of this island; then hauled to the southward, into the common track. Other ships, during the south-east monsoon, returning from China, have made the west end of Weyoogee, and pushed through the channels between it and Gillolo; afterwards through the channels formed between Pulo Popo and Oby Major, into the Pitt's Passage, with great facility.

On the coast of New Guinea, to the eastward of Point Pigot, there is sometimes severe squalls from the land; but they are of very short duration.

#### FROM PULO POPO TO THE WESTWARD.

In the south-east monsoon, passing from Pulo Popo through the Pitt's Passage to Bouton, it may be proper to keep nearest the islands on the south side of the channel, as a precaution against any currents that may set to the northward. The direction of the currents appear irregular in this track, during the south-east monsoon, but in general to the westward, viz. between north-west and south-west; particularly between Bouton and the Token Bassias Islands, it often runs to the south-east, and afterwards W. S. W. or south-west, to the Straits of Salayer. Nevertheless, it may be proper to keep more than mid-channel, towards the islands on the south-side, in passing along from Pulo Popo to Bouton, the prevailing winds being from south-eastward.

Being past Pulo Popo to the westward, a ship may keep nearly in mid channel, inclining a little towards the Islands Ceram, Bonoa, and Bouro. From the north-west end of this island, steer a direct course towards the north Token Bassias Islands, which bears from the north-west end of Bouro, S. 48° W. distant about 64 leagues. If thick weather prevails, be cautious of not running to the southward of these islands for they are supposed to be dangerous about their southern limits. When the northernmost of the Token Bassias Islands is seen, it may be passed at the distance of five or six miles from its northern shore: then steer for the south-east part of Bouton, and when round the south-end of this island, steer to pass between Middle Island and South Island, in the Straits of Salayer.

From Dampier's Strait, most of the Islands throughout the Pitt's Passage are steep to; there being no soundings obtained in navigating amongst them: however, in large manuscript plans of the Islands Ceram and Bouro, constructed by a Dutch

officer, experienced in the coasting navigation here, there are soundings placed on some parts of the north coast of Ceram, but very near the shore. In the same plans, soundings are projected along the south shore of this island, and nearly all round the Island Bouro. A spit extends from the north-west end of Bouro, to a small distance, and soundings of moderate depths for anchorage, at this part of Bouro, are delineated on the plan. Notwithstanding, it may be inferred, that moderate depths for anchorage is not to be expected, except near the shore, and probably too close for ships to anchor with safety.

When through Salayer Straits, a speedy passage will be made to Sunda Strait, if bound to Hindoostan, or through Gaspar Strait to the Strait of Malacca, if a ship is bound to Prince of Wales's Island and Bengal.

A ship from China bound to Europe, by the passage just described, when through Salayer Strait, may pass by the Straits of Sapy, or Allass, into the ocean, as seems more eligible.

During the period of the south-east monsoon, although the winds in the Pitt's Passage prevails, generally speaking, from the south-eastward; yet, in the Banda Sea, between Amboyna and Timor, its direction is mostly from east-south-eastward. From this circumstance, a ship passing down to the southward, between Manipa and Bouro, may frequently be able to weather Ombay, by stretching from Manipa on a wind, through the Banda Sea; and then pass between Ombay and Wetter, along the north-west coast of Timor, and between Semau and Savu. It perhaps ought to be esteemed the preferable route in time of war, from its probable greater security against enemies cruizers, than any of the straits further to the westward; and also even in times of peace, from its being a shorter cut into the steady south-east trade, and the quickest mode of clearing the islands. If a ship cannot weather Ombay, she may pass to the westward, along the north coasts of Ombay Panter, &c. and pass out by the Strait of Floris, between the Island Solor, and the east end of Floris: but as this passage is narrow, with rapid tides, it probably would be most prudent to steer on to the westward, along the north coast of Floris, and pass out by the Strait of Sapy; but it must be observed, that great care is requisite in passing to the northward of Floris, there being several dangerous shoals situated between this island and the Kalatoa (or Schidam) Islands to the northward. On one of these the ship Bangalore was lost, April the 12th, 1802. From the wreck Floris (or Mangerge) bore from S. W. to E. S. E. about 12 leagues, an island off Mangerge, forming like a dome S. S. W. 7 or 8 leagues, and an island, supposed to be Schedam, N. W. 9 or 10 leagues. Another of these shoals bears S. E.  $\frac{1}{2}$  E. from Kalatoa about 8 leagues. Probably the safest track along here is to keep within a few leagues of the Floris shore.

In proceeding by the Ombay Passage, should a ship be in want of water, Baring's Bay on the north-east side of Sandal Wood Island, where his Majesty's ships Leopard and Thames watered in 1790, is convenient for this purpose in the westerly monsoon, there being good anchorage in it, from 8 to 15 fathoms mud, at half a mile to one mile off shore, near the entrance of the river, where the boats go in for water : and Copang Bay, at the west end of Timor, formed between it and the Island Semau, is recommended in the easterly monsoon, as a refreshing place in times of peace. Here is the town or village Copang, having a fort, called Concordia, for its protection, in possession of the Dutch.





**APPENDIX :**

**BEING**

**A LIST**

***SEVERAL SHOALS AND ISLANDS,***

**THE**

**TRUE SITUATION OF WHICH ARE INCORRECTLY  
PLACED IN MOST CHARTS ;**

**AND**

**SOME OF THEM ARE NOT LAID DOWN IN ANY CHART  
THAT IS PUBLISHED.**



## APPENDIX.

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SINCE the Memoir of a Chart, explanatory of the Navigation of the China Sea, was printed, Captain John Brown has communicated his remarks on a shoal. This he passed at three miles distance, on November 13th, 1804, in the ship Triton from China, at the conclusion of a gale of wind from the westward: this gale having driven them too far to the eastward of the fair track, in returning by the Inner Passage towards Malacca Strait. "November 13th, at day-light, saw a shoal on our lee beam (our head at that time N. W.) bearing from N. E. to E. distant 3 or 4 miles; sounded but got no ground. Steering N. W. with a light breeze at W. S. W. lost sight of it at 7 A. M. from the mast-head. On the east end there was a high lump of sand, I suppose about 20 feet high, with very high breakers extending to the southward. The shoal appeared to be about three miles in length, and in latitude  $15^{\circ} 49'$  N. deduced from a good observation on the following noon. The longitude, by stars east and west of Moon, taken in the night preceding,  $111^{\circ} 06'$  E. and by mean of three chronometers in  $110^{\circ} 52'$  E."

By an extract from the Triton's log-book, which I received at the same time, the shoal appears to be situated more easterly than Captain Brown's position; for by computing the ship's run, from the shoal to noon observations, places it in longitude  $111^{\circ} 16'$  E. by lunar observations, in  $111^{\circ} 02'$  E. by mean of three chronometers, and in  $111^{\circ} 17'$  E. by account.

This is the only shoal about the north-western limit of the Paracel Group, whose situation is known. It appears the extent of danger on a parallel is nearly two

degrees, about the sixteenth degree of north latitude: for the shoal seen in the Bombay Merchant, in 1800, is in latitude  $16^{\circ} 06'$  N. and in longitude  $112^{\circ} 54'$  E.

Returning from China, in August 1804, the appearance of some shoals were seen in the ship Alexander, in latitude about  $14^{\circ} 10'$  N. whilst in sight of the coast of Cochin China. They saw the wreck of a Chinese junk, which was supposed to be aground upon a shoal. Shortly after they saw, from the mast-head, the appearance of two more wrecks (or rocks above water), with apparently broken water between them; same time extremes of the land bore S.  $58^{\circ}$  W. to W.  $4^{\circ}$  N. the remarkable Round Mountain on the main S.  $70'$  W. upon approaching which, there is seen on it a large rock resembling a pagoda.

REMARK.—It has been supposed by several navigators, that nearly in latitude  $14^{\circ}$  N. there are dangers situated so near the coast of Cochin China, that the land is discernible from them in clear weather: and wrecks of junks having been seen in the Alexander, may seem to confirm this supposition. But it is remarkable, that in the Anna, we could not discover any indication of danger hereabout; although at one time we passed over the situation assigned to these shoals; and at another time, to the eastward of them, distant from the land upwards of a degree, being then too far from it, for any of the hills to be visible above the horizon. This was done to discover, if possible, whether these shoals did really exist; but nothing but a clear sea appeared to view. It may, however, be prudent for ships to keep within 10 or 12 leagues of the coast, when near the latitude of  $14^{\circ}$  N. although I cannot help thinking, that no dangers exist within a degree of the coast.

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## I. IN THE SOUTHERN ATLANTIC OCEAN.

THE Island St. Paul's, called also St. Peter's, and Panedo, "is in latitude  $00^{\circ} 50'$  N. and in longitude  $29^{\circ} 38'$  W. by lunar observations: it is low and covered with trees." This position by Captain Sword, commander of the American ship Samson, who passed near it in 1798.

## SAXEMBURG.

This island, if it exists, in latitude  $30^{\circ} 47'$  or  $30^{\circ} 50'$  S. as generally placed in the charts, is either much further to the eastward, or westward, than the position given it in the charts ; for twice we have crossed over this position, steering east, with a desire to see it. Captain Galloway, in the American ship *Fanny*, outward bound to China in 1804, judges he saw this supposed island at a great distance. It was in sight four hours from the mast-head, without altering its appearance, which was a peaked hill in the centre, and bluff at one of the extremities : if this was land, it is situated in the same parallel assigned to Saxemburg Island in the charts, but two degrees more to the eastward.

## GOUGH'S ISLAND.

Captain Benners, of the American ship *Dispatch*, outward-bound to China in 1804, passed close to this island, and made it in longitude  $9^{\circ} 50'$  W. An American commander was on it several months, killing seals, and made the longitude  $10^{\circ} 00'$  W. There is a small bay or cove where boats can land, and where seals come on shore to bask. Honourable Company's ship *Coutts*, October 21, 1800—  
 “ At 8 A. M. the east point of Gough's Island, S. W.  $\frac{1}{2}$  S. 10 leagues, being then in longitude  $9^{\circ} 21'$  W. by chronometer. Run 28 miles E. b. S. to noon, and observed in latitude  $39^{\circ} 40'$  S.” It appears, by this extract, that the east point of Gough's Island is in latitude  $39^{\circ} 58'$  S. and longitude  $9^{\circ} 40'$  W. How discordant are these positions of this island in longitude, from what it is represented in the charts !

At 6 A. M. when the island was first seen by the *Coutts*, it bore S. W. b. S. 8 or 9 leagues. There is part of the crew of an American ship, at present 1804, left on Gough's Island to kill seals.

## II. IN THE INDIAN OCEAN.

AUGUST the 23d, 1801. The convoy from China, at half past 5 P. M. his Majesty's ship Bellequeux had soundings 80 fathoms\*, and directly after 132 fathoms; the other ships got no ground. When the Bellequeux had 80 fathoms, her position was in latitude  $28^{\circ} 43'$  S. and longitude  $43^{\circ} 33'$  E. by lunar observation.

## JOHN DE NOVA,

In Mosambique Channel, appears to be in latitude  $17^{\circ} 09'$  S. and in longitude  $42^{\circ} 24'$  E. by good chronometers.

## CAPE AMBRE, MADAGASCAR.

In longitude  $49^{\circ} 21'$  E. by three chronometers, in a run of 13 days to Bombay, allowing Bombay in  $72^{\circ} 57' 45''$  E.

## POSITIONS OF PLACES BY CAPTAIN DAVID INVERARITY.

“ An island supposed to be Alphonsa, latitude  $7^{\circ} 04'$  S. longitude  $52^{\circ} 21' 30''$  E. by several sights of Sun and Moon. Due south from this island, five leagues, a sand bank 5 or 6 feet above water is situated, extending north-east and south-west, about 5 or 6 miles. This sand bank is surrounded with a reef, on which the sea breaks very high.

“ Positions of the places on the north-west coast of Madagascar as follows :

			Latitude.	Longitude.	
Boyena Bay	—	—	$15^{\circ} 38'$ S.	$46^{\circ} 05'$ E.	
Bembatooka Bay	—	—	$15 50$	$46 33$	Var. $17^{\circ} 28'$ W. in 1803.
Majambe Bay, H. W. Full and Change at 5 hours, rises					
13 feet	—	—	$15 09$	$46 06$	$16 25$
Island Noss Sancasse, entrance of Narreenda Bay, at					
4 H. 45 M.	—	—	$14 31$	$47 45\frac{1}{2}$	$15 50$
Bay of Mambacool, or Dalrymple's Bay	—		$13 31$	$48 09$	
Passandava Bay, or the Town	—	—	$13 45\frac{1}{2}$	$48 24\frac{1}{2}$	$14 45$
West Island, off Cape St. Sebastian	—		$12 28$	$48 54$	Var. $14 00$ near it.

\* The Brunswick (with the Royal Charlotte in company) in latitude about  $37^{\circ}$  S. far to the eastward from Cape Lagullas, is said to have got soundings on a bank, supposed the Slot Van Capelle.

"Bullocks and refreshment, wood and water to be procured in great plenty, on most reasonable terms, at all the foregoing places: the inhabitants inoffensive and fair dealing, hospitable people.

"Mambacool Bay is particularly safe; and commodious for wooding, watering, and refreshing ships. In going in, keep the west point of the entrance on board. This bay is not inhabited, but abounds with fish.

"EAST COAST OF AFRICA, ENGLISH RIVER, in Delagoa Bay, latitude  $25^{\circ} 58' S.$  longitude  $32^{\circ} 41'$  east, variation in 1803,  $28^{\circ} 07' W.$  high water, at 5 h. 15 m. rises 14 feet.

"MOZEMBIQUE, in latitude  $15^{\circ} 01' 30'' S.$  longitude  $40^{\circ} 46' 38'' E.$  from Greenwich. Variation  $18^{\circ} 40' W.$  high water at 4 h. 15 m. rise of tide 12 feet."

"AFRICAN ISLANDS are two in number, very small and low, situated about six leagues N. N. E. from the bank which surrounds the Amirante Islands, and were discovered about six years ago, by some of the small vessels, which navigate in the Seychelle Archipelago. They are almost covered at high water spring-tides, having shrubs on them only about four feet high; there is no fresh water on them. A sand bank, dry at low water, connects the two islands; and their whole extent, north and south, is not above two miles: the eastern side is fronted by a reef of breakers; and, on the west side, there is safe and commodious anchorage, in a bay formed by the extremes of the isles, and the reef which joins them. The latitude taken on the southern island is  $4^{\circ} 55' S.$  longitude, by the mean of many observations of stars, on each side, off moon,  $54^{\circ} 9' 28'' E.$  Variation in 1801,  $7^{\circ} 44' W.$  high water, full and change, at 9 h. 39 m. rise of tide about 8 feet.

"His Majesty's schooner Spitfire was wrecked on the reef, contiguous to these islands, August 21, 1801, in the night. They are not laid down in the charts."

#### BANK WESTWARD FROM DIEGO GARCIA.

His Majesty's ship *La Dedaigieuse*, in latitude  $7^{\circ} 39' S.$  being noon, when the *Centurion* made the signal for being in 17 fathoms water; and shortly after, for soundings, 25 fathoms. The *Centurion* bore S.  $\frac{1}{2}$  W. from the *Dedaigieuse*, at the time  $1\frac{1}{2}$  mile. Longitude of the latter ship  $70^{\circ} 52' E.$  by sun and moon; by chronometer  $70^{\circ} 53' E.$  and course made from Diego Garcia south point W.  $7^{\circ} S.$  99 miles. The other ships in company had no soundings.



## SOUTHERN LIMITS OF THE MALDIVE ISLANDS.

Monsieur Bonvouloir, in the ship *Fatty Rair*, on May 27, 1795, passed on the north-west side of the two islands, at a considerable distance, southward from the southern limit of the Maldive Chain. They are of moderate height, about three leagues and a half apart. The Eastern Island in  $72^{\circ} 01'$  E. longitude from Paris; and the other  $71^{\circ} 52'$  E.; their latitude  $00^{\circ} 42'$  S. From these islands he steered N. b. E. and made the south end of the Maldive Chain; by lunar observations, within two miles of the reef, he made the south end of the chain in longitude  $71^{\circ} 52'$  east from Paris, and in latitude  $00^{\circ} 13'$  N. being fifty-five miles north, from the westernmost island before mentioned. The southern part of the chain which he saw, extended on a parallel to the westward, so far as visible. The south-east limit of the Maldive Chain he made in latitude  $00^{\circ} 27'$  N. and longitude  $72^{\circ} 11'$  east from Paris.

## REEF NEAR SEUHELIPAR, LACCADIVE ISLANDS.

" April the 19th, 1804, at 11 P. M. the ship *Anne*, from the Red Sea, struck and bilged before day-light upon a reef. At day-light, from the wreck, the northernmost Seuhelipar Island bore E. S. E. four or five leagues; and the southernmost island S. E. about 6 leagues: the extremes of the Wreck Reef from S. W. to E. N. E. being in extent 10 or 12 miles."

## CHERBANIANI BANK.

November the 8th, 1791, Captain Chalmers, in the ship *St. George*, by noon observation, made the Island Betra-par, in latitude  $11^{\circ} 34'$  N. Lieutenant Wedgeborough makes it in latitude  $11^{\circ} 33'$  N. and longitude  $72^{\circ} 24'$  east from Greenwich. November the 9th, by noon observation, Captain Chalmers made the body of the breakers, on Cherbaniani Bank, in latitude  $12^{\circ} 22'$  N. and 21 miles west from Betra-par, which deducted from Lieutenant Wedgeborough's longitude of this island, there remains  $72^{\circ} 03'$  east longitude, from the western verge of Cherbaniani Bank, in

latitude  $12^{\circ} 22' N$ . It is probable this position is nearly correct, as Lieutenant Wedgeborough's and Lieutenant McCluer's longitudes of the Laccadive Islands agree.

With a fair wind, Captain Chalmers steered along the edge of the bank, at 5 and 6 miles distance, the breakers very high, although the water was smooth; and several rocks above water appeared, but are probably overflowed at high spring-tide.

#### APALURIA ISLAND.

From England, on her passage to Bengal in 1800, the Phenix gives the latitude of this island  $9^{\circ} 30' S$ . and longitude  $89^{\circ} 14' E$ . by lunar observations. It extends N. N. E. and S. S. W. 7 or 8 leagues in circumference, is high and uneven: may be seen 14 or 15 leagues distant. This ship sailed round it.—N. B. The preceding is an abstract from a Calcutta newspaper, dated Feb. 3, 1801; and it may probably be inferred, that it was not land of such elevation and magnitude that this ship saw, but a deception from a stationary cloud at the horizon.

#### BALE OF COTTON ROCK,

Said to be in latitude  $5^{\circ} 25' N$ . and longitude  $87^{\circ} 48' E$ . by Mr. Douglas, an officer on board the Countess of Errol, said to have been on this Rock in 1794; it is formed like a ship's bottom, and about 230 yards in length, covered with Barnacles, and nearly six feet above the level of the sea. On the east side is soundings 120 and 130 fathoms; on the north-west and south sides no ground. The longitude supposed by account.

Captain Le Meme gives the following description of this Rock, who is said to have been on it, in December 1797; and determined its position by an excellent chronometer, and by lunar observations: says, "in  $5^{\circ} 18'$  north latitude, and  $88^{\circ} 20'$  east longitude from Paris, there is a small island 25 or 30 feet above the surface of the sea; and between 50 and 60 feet long, and 20 feet in breadth: it is situated on a sandbank, which extends about 300 feet in a N. E. and S. W. direction. At half a mile's distance from it, there is no soundings, with 100 fathoms of line, and a boat's length from it, 20 fathoms water."

Reef, in latitude  $1^{\circ} 20'$  N. and  $92^{\circ} 00'$  east from Paris, by Captain Le Meme, who saw it in January 1797. Night approaching, the boat could not land on it; but the officer reported it to be 8 or 10 feet above water, and about a mile long, from east to west: no soundings at a mile's distance from it.

Captain Le Meme commanded the *La Unie* French privateer. If the Bale of Cotton Rock, or this Reef exists, it is possible that the *Foulis* Indiaman, or *Prince of Wales*, belonging to Bombay, may have perished on one of them; these being both missing ships, navigating between Sumatra and Ceylon. But it is still a query, whether these Shoals (or Rocks) exist: caution is, however, requisite, in approaching near the positions described by Le Meme.

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### III. IN THE JAVA SEA.

REEF off the north-east end of Banca. The American ship *Severn*, Captain John Whetton, from New York, bound to China, in 1802—"May the 23d, at sun-set, Gaspar Peak S. E.  $\frac{1}{4}$  S. 14 or 15 miles; steered N. W.  $\frac{1}{4}$  N. 35 miles from sun-set to day-light, at which time struck on a coral reef, and found the tide setting north-north-westward; the ship stuck fast on the reef until the following high-water tide, when she was hove off with a bower anchor, having previously been lightened of 30 tons of ballast, or more."

The water ebbed about 19 inches perpendicular, from the time the ship struck to low water.

The dimensions of the Reef were not explored; but the part visible from the ship when aground, extended in a direction N. N. E. and S. S. W. 2 or 3 miles. The shoalest part observed, was on a rock, under the ship's larboard quarter, 10 feet at low water.

When aground on this Reef, high land, in detached pieces, making Like Islands, which I judge to be part of Banca, bearing from S. W. b. S.  $\frac{1}{4}$  S. to S. W. b. W. A high saddle mountain, at a greater distance than the other land, supposed to be inland on Banca. The nearest land, appeared to be about 7 leagues distant from the Reef. When aground on this Reef, the observed latitude was  $1^{\circ} 40'$  S.

## SHOAL, NEAR PULO MANCAP.

His Majesty's ship *Fox* grounded on this Shoal, in  $2\frac{1}{2}$  fathoms water : the latitude  $3^{\circ} 31'$ , or  $3^{\circ} 32'$  S. longitude  $110^{\circ} 04'$  east, by lunar observation ; and  $110^{\circ} 12'$  E. by chronometer. The position of the ship when aground, was on the southern end of the Shoal, and S.  $31^{\circ}$  W. eleven miles and a half from the south end of Mancap Shoal, as placed in Robertson's Chart. Rocky bottom, and foul ground, appeared to extend far to the northward of the ship, when aground : had two fathoms northward from her. No land in sight from the mast head.

"A Ridge of Rocks, discovered by his Majesty's ship *Arrogant*, in January 1802, extending north-west, and south-east, a quarter of a mile, with five feet on it where the boat could approach with safety ; five fathoms at half a cable's length, and 25 fathoms at a quarter of a mile distance. Its latitude  $5^{\circ} 12'$  S. longitude  $112^{\circ} 58'$  E. mean of four chronometers."

## SHOAL, NEAR BANCA.

"Rhio Schooner, September the 13th, 1802, saw a Reef of Rocks, above water, bearing W. b. N. one mile ; same time, Monapin Hill, N. W.  $\frac{1}{4}$  N. off the Banca Shore 6 or 7 miles."



## IV. IN THE CELEBES SEA.

"AT midnight rounded the S. E. point of Bouton, in latitude  $5^{\circ}$  south, close to within a musket shot. From that time made about a S. S. E. course, distance run twelve or fourteen miles, and struck on a sand bank and coral, at five A. M. Found the west point to be a reef of rocks, steep to : the east point, and the middle of this shoal, a soft coral and sand bank : its latitude  $5^{\circ} 30'$  S. longitude  $124^{\circ}$  east from

Greenwich. The point on Bouton, which I suppose forms the entrance of the straits, W.  $\frac{1}{2}$  N."

N. B. It appears from this extract, to be difficult to point out the true place of the shoal just described: by the longitude and latitude mentioned, there is reason to think that this ship mistook the Token Bassias for Bouton; and grounded on a shoal, near the east side of the former.

But it may possibly have been Bouton East Point, in latitude  $5^{\circ} 15'$  S. longitude  $123^{\circ} 15'$  E. which they rounded at midnight; if so, this dangerous Shoal must be situated a few leagues off the south-eastern part of Bouton, which has hitherto been thought a bold coast, with a broad clear channel to the eastward and southward.

#### BANKS IN BONTHIAN BAY.

"Ship Thomas, January 23d, 1800, having Middle Island, in Salayer Strait, open with the south point of North Island, about two ships' lengths, bearing E. b. S.  $\frac{1}{2}$  S. and Bonthian Hill, N. W.  $\frac{1}{2}$  N. distance off the Celebes Shore 6 or 7 miles, and off North Island 4 or 5 leagues; saw the ground, under the ship's bottom so plain, as to imagine the ship would strike; but had not less than  $7\frac{1}{2}$  and 8 fathoms: bore up to the southward, and instantly deepened to 13, 14, and 17 fathoms, and no ground 40 fathoms. I cannot say this bank is dangerous; I should rather imagine not, as it lies in the exact track from Bonthian Roads to the Straits of Salayer."

"Ship Amboyna, Feb. 9th, 1800, at half past 9 A. M. saw breakers on the lee bow, put the helm down, and just cleared them about a ship's length. When close to this shoal, the eastern extreme of Celebes E. b. N. North Island E.  $\frac{1}{2}$  N. Middle Island east, North Point of Salayer S. E. b. E. sent the cutter, with the 1st officer, to sound; tacked, and stood after her; least water ten and a half fathoms coral rock. When the Shoal bore south, about half a mile distant, the flag-staff of Boele Comba then bore N. W. nine or ten miles, the west extreme of Celebes W. b. N. north point of Salayer S. E.  $\frac{3}{4}$  E. the east point of Celebes E.  $\frac{3}{4}$  N. North Island E.  $\frac{1}{4}$  N. This Shoal is circular, and about half a mile across: the water being smooth, we could barely see the breakers, but it was of a light green colour the whole extent of the Shoal: there is one rock, just even with the water's edge: this is a very dangerous Shoal, as it lies immediately in the fair-way; there is a good passage on either side of it."

N. B. This certainly cannot be the Shoal on which the *Mansfield* had  $3\frac{1}{4}$  fathoms; for it is said to be  $4\frac{1}{2}$  leagues from the Celebes Shore, bearing S.  $\frac{1}{2}$  W. from Bonthian Hill.

“ Ship *Amboyna*, February 10th, 1800, sounded in  $14\frac{1}{2}$  fathoms rocks, the cutter 100 yards to the southward, had no ground 30 fathoms. Shoaled to  $8\frac{1}{2}$  fathoms, hauled up S. E. and in three casts deepened to 55 fathoms. When in  $8\frac{1}{2}$  fathoms, the body of Middle Island, in Salayer Straits, bore south, distant about two miles and a quarter. I believe this Shoal to be of very small extent, and that there is not less than eight fathoms on it; but it is alarming to shoal from 60 to 14 and 9 fathoms: it is not laid down in any charts; it is therefore plain that this passage is not well explored.

“ Not being able to weather Middle Island, I was obliged to pass through the channel on the north side of it, but would by no means advise ships to pass this way; the channel on the south side being much broader and better known.”

#### SHOAL, NEAR CERAM.

About three leagues eastward from Ceram, directly between it and Mysore, is a dangerous shoal, in the form of a horse-shoe, part of it dry at low water spring-tides; about three miles in extent, and steep to. The ship *Venus*, of Bombay, was wrecked on this Shoal, in July 1799.

#### CORAL SHOALS NORTHWARD FROM FLORIS.

“ The ship *Bangalore*, from Amboyna, towards the Strait of Allas, on the 12th of April, 1802, observed at noon, in latitude  $7^{\circ} 38'$  S. longitude  $120^{\circ} 45'$  east; and at 9 P. M. the ship struck on an unknown coral bank. When day-light appeared, the bank was found to extend from north to south, about 3 miles in length, and two in breadth; the western part dry at low water, with rocks upon it, appearing like a number of prows under sail. From the wreck on the shoal, the Island Floris, or Mangerye, from S. W. to E. S. E. distant 12 or 13 leagues, an island supposed to be Schiedam, N. W. 9 or 10 leagues; and an island off Mangerye, forming like a dome, S. S. W. 7 or 8 leagues. The anchor was carried out with the whole cable, and was then only a peak, owing to the steepness of the bank. The ship soon bilged, and was totally lost on this shoal.”

Ship *Angelica*, July 3d, 1801—"In the passage from Amboyna, saw a shoal bearing from S. b. W. to W. N. W. ; bore up to the northward of it. Saw three Malay Prows at anchor on the shoal ; on our approach, they weighed and made sail. This shoal bears from Kalatoa S. E.  $\frac{1}{2}$  E. distance about 8 leagues ; it is about 4 miles in a circular form, and the north and south ends of it nearly dry. Longitude of it,  $122^{\circ} 18' E.$ "

#### DE SERRES' BANK, ALSO CALLED LAAR OR BOÛT.

"This bank appears more extensive than generally laid down, from east to west ; or rather that there is a range of banks, beginning near the Hen and Chickens. I have never heard of less water than five fathoms, being found on De Serres Bank, to the southward of  $5^{\circ} 45' S.$ "

His Majesty's ship *La Dedaigieuse*—"Sunday, December 19th, 1803, struck soundings of from 13 to 7 fathoms, in latitude  $5^{\circ} 48' S.$  and longitude  $118^{\circ} 24' E.$  or  $3^{\circ} 56' E.$  from Great Solombo by chronometer, when it bore north the preceding day, at 8 A. M. distant 3 or 4 miles. It seems that this position, is the eastern verge of these banks ; for the bottom was seen several times, during the run of 7 or 8 leagues, from day-light till 8 o'clock : after which, we deepened off thence entirely, and had no more soundings.

Allowing the Brill Shoal  $4^{\circ} 30' E.$  from Great Solombo, (which has been measured by chronometer) will make our position of soundings 13 to 7 fathoms, 34 miles west from the Brill : and taking this distance from 60 miles, (the western verge of De Serres' Bank from the Brill) leaves 26 miles for the breadth of the bank, (or chain of banks) beginning in longitude  $117^{\circ} 58' E.$  about 6 miles east from the meridian of the Hen and Chickens. After getting off the edge of this bank at eight o'clock steered east, and at noon observed in latitude  $5^{\circ} 49' S.$  but did not get sight of the Brill Shoal in passing ; as it was rather squally, and the horizon obscured to the southward."

#### SHOAL NEAR RAGGED POINT.

Ship *Hercules* (supposed in 1802)—"At 2 P. M. saw discoloured water from the mast-head, bearing E. b. S.  $\frac{1}{2}$  S. about two miles ; same time Ragged Point, N.  $34^{\circ} W.$  Flat Point, S.  $44^{\circ} W.$  At 3 h. 30 m. tacked in 17 fathoms, the shoal bearing from S.  $39^{\circ} E.$  to S.  $66^{\circ} E.$  distant about half a mile, Ragged Point then N.  $33^{\circ} W.$

Flat Point S.  $47^{\circ}$  W. At 3 h. 40 m. the boat in  $1\frac{1}{2}$  fathoms on the shoal, bore S.  $46^{\circ}$   $30'$  E. three quarters of a mile, then on the southern end of it; same time Flat Point S.  $46^{\circ}$  W. and Ragged Point N.  $33^{\circ}$  W. in 18 fathoms, green ouze, and distant from the nearest part of Borneo about 8 or 9 miles. A little after the boat, with a flag up, bore S.  $66^{\circ}$  E. distance about one mile, and then in three feet water. At this time, Flat Point bore S.  $44^{\circ}$  W. and Ragged Point N.  $32^{\circ}$  W. in 14 fathoms, distant from the shore about 8 miles. This Shoal has from two fathoms to three feet water on it, coral, sand, and stones; the water breaking very little on it, though at this time there was a great swell: it appears on the water like a long mark, occasioned by the reflection of a cloud passing the sun. It lies about 10 or 11 miles from the Borneo Shore.

“ At five, tacked and stood in shore, shoaling our water gradually, from 15 to 5 fathoms, where we tacked at half past 6 P. M. off shore  $3\frac{1}{2}$  miles, Flat point S.  $39^{\circ}$  W. and Ragged Point N.  $15^{\circ}$  W.; latitude, the preceding noon,  $2^{\circ} 21'$  S. longitude per chronometer  $116^{\circ} 42'$  E. Ragged Point, bearing N.  $46^{\circ}$  W. and Flat Point S.  $49^{\circ}$  W.—Courses steered from noon to 3 P. M.

H.	K.	F.	Courses.	Winds,	Soundings.
1	2		S. W. b. S.	Variable	21 16 17 15.
2	1.	4	W. b. S.		15 17 $17\frac{1}{2}$ 16 tacked.
3	1	2	S. E. b. S.		13 $15\frac{1}{2}$ 16 17.”

## V. IN THE SOOLOO SEA.

BANK of Coral, near Banguey. Fly Cruizer, 1796, August 20—“ At 4 P. M. saw rocks under the bottom, had four fathoms coral, wore and stood N. N. W. a quarter of a mile, deepening as fast as the lead could be hove to 22 fathoms: sent the boat to the eastward, wore and stood after her, soundings 17, 15,  $7\frac{1}{2}$ , 8, and 10 fathoms, coral; Banguey Peak W.  $\frac{1}{2}$  N. distance about 9 leagues, having steered since wearing E. S. E. to S. E. b. S. two miles, being then 6 P. M. the wind, at this time, decreasing to a calm. At 8 P. M. in 21 fathoms, ship's head easterly, being



clear moon-light, shortly after saw again the rocks under the bottom, had  $5\frac{1}{2}$  fathoms coral, edged away to the northward with a faint air, and deepened to 7, 8,  $9\frac{1}{2}$ , 11, 13, 20, and 27 fathoms, then anchored."

#### SHOAL IN BASEELAN STRAIT.

Extract from the ship *Britannia's* Journal—"There is a Shoal in the Strait of Baseelan, mid-way between an island and the southern shore of Mindano four fathoms, on it, rocky bottom; also frequent overfalls all through this passage.

"Bearing at anchor, at the town of Samboagan, east extreme of Baseelan S.  $44^{\circ}$  E. west extreme of do. S.  $47^{\circ}$  W.; west extreme of Mindano N.  $66^{\circ}$  W. 3 or 4 miles distant; the southern angle of the fort N.  $85^{\circ} 30'$  E. half a mile; viz. the high spire on this angle, Cocoa and Sibago Isles nearly in one, S.  $63^{\circ} 30'$  E. the nearest part of Baseelan S.  $11^{\circ} 30'$  E. 7 or 8 miles; magnetical bearings. Variation by mean of several azimuths,  $00^{\circ} 03'$  westerly; longitude, by mean of 15 observations of Stars and Moon,  $122^{\circ} 06' 15''$  E."

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#### VI. IN THE CHINA SEA.

SHOALS seen in the ship *Ardassier*, bound to China in 1802—"October 22d, saw the breakers on Wimpole's Shoal: made them in latitude  $7^{\circ} 56'$  N. and in longitude  $113^{\circ} 20' 30''$  E. by lunar observations and chronometer. The high breakers on this shoal extend in a N. E. and S. W. direction, with a dry sand bank on the north-west end, and a small spot of breakers, about a quarter of a mile from the north end of the shoal.

"The easterly current carried us to the northward of the breakers, when we were endeavouring to work round the south-west end of them.

"October 24th, latitude  $7^{\circ} 51'$  N. longitude  $114^{\circ} 16'$  E. by chronometer; breakers then (being noon) bore N. E. 6 or 7 miles; suppose them those seen by the Walpole.

“ October 25th, noon latitude  $7^{\circ} 35'$  N. longitude, per chronometer,  $114^{\circ} 39'$  E. in seven fathoms coral; breakers from the mast-head W. S. W. and the water discoloured as far as S. S. E. on the lee bow.

“ October 26th, latitude  $7^{\circ} 33'$  N. longitude  $114^{\circ} 36'$  E. by chronometer and lunars, no ground 85 fathoms, being just clear to the south-east of the reefs. This day, with the wind from the westward, endeavoured to turn to windward, on purpose to pass on the west side of dangers in sight; but while beating, was carried to the eastward by the current, through a gut in the Coral Bank; having breakers in sight to the northward and southward of us.

“ It appears, from latitude  $7^{\circ} 56'$  N. longitude  $113^{\circ} 20' 30''$  E. where we first made Wimpole's Reef, to latitude  $7^{\circ} 33'$  N. longitude  $114^{\circ} 36'$  E. the eastern limit of the bank we were on this day; that the space comprehends an extensive coral bank, with deep gaps in several places of it, where there is no soundings: but on many places there is high breakers, and extensive coral flats under water; several of the ridges having apparently very little water on them.

“ In working from side to side of the gut, which we were drove through this day, we generally tacked in from 6 to 8 fathoms on either side, and from 16 to 30 fathoms in the middle of the gut, but not regular. At anchor in the night, on the flats, had shoal water all round us. In the morning, endeavouring to weigh the anchor, found it had hold of a rock: the cable parted; then steered through the places where the water appeared deepest: on one spot had  $4\frac{1}{4}$  fathoms, and there appeared near us, in several places, less water.

“ From the time of seeing Wimpole's Reef, till we cleared the shoals on the 26th, were never more than a few hours at a time without having soundings, or seeing shoal water, which makes it very probable, that this is a continued coral bank of great extent, with deep gaps in it, separating the reefs above water, and the numerous ridges of coral under water, from each other.”

#### ROYAL CHARLOTTE'S SHOAL.

In latitude  $7^{\circ} 00'$  N. longitude  $113^{\circ} 54'$  E. is a shoal, seen in his Majesty's ship *Resistance*, and supposed to be that seen by the *Royal Charlotte*.

Captain Dickie, in the ship *General Wellesley*, in 1804, saw the *Royal Charlotte's* Shoal bearing N. W. b. W. 6 or 7 miles; being noon, the observed latitude was  $6^{\circ} 53'$  N. and the longitude of ship, by mean of two chronometers,  $114^{\circ} 10'$  E.

## LOUISA SHOAL.

Ship *Angelica*, August 3d, 1802—"At noon, the observed latitude  $6^{\circ} 19' N.$  steered E. b. N.  $6\frac{1}{2}$  miles, and E. N. E. 6 miles; being then 2 P. M. saw a shoal, which we passed at the distance of 2 or 3 miles. On its north-east end are several small rocks above water, and it appears 3 or 4 miles in extent, in an east and west line. When the west end bore south, had altitudes for chronometer, which made the shoal  $8^{\circ} 44' E.$  from Pedro Branco, and  $5^{\circ} 12' E.$  from North Natuna; and its latitude  $6^{\circ} 20' N.$ "

## LOUISA SHOAL SUPPOSED.

Ship *Britannia*, in January 1794—"The situation of this Shoal appears incorrectly laid down in the charts. We had a very good observation for the latitude at noon, and very correct altitudes for the time-keeper in the morning. Its longitude I find is  $113^{\circ} 46' 30'' E.$  and  $4^{\circ} 3' 30'' W.$  from the little Isles of Mangsee, at the east entrance of the Strait of Balambangan; the latitude is  $6^{\circ} 23' N.$  Mr. Robertson, in his General Chart of the China Seas, places the Louisa Shoal in latitude  $6^{\circ} 14' N.$  and longitude  $112^{\circ} 31' E.$  I do not assert that the shoal we saw is the Louisa: we did not try for soundings; were of opinion it is steep to in every part, and deep water."

REMARK.—It may be inferred, that it was the Louisa Shoal seen by the *Britannia*; but it appears difficult to conceive how this ship places it in longitude  $113^{\circ} 46' 30'' E.$  for the following reasons:—They made  $4^{\circ} 3' 30''$  difference of longitude west, from the Mangsee Islands to the shoal. In Mr. Dalrymple's Chart, these islands are placed  $3^{\circ} 33' E.$  from the meridian of Grand Ladrone; and  $113^{\circ} 44' E.$  is certainly near the true position of this island: it therefore appears, in using this comparison, that the Mangsee Islands is in longitude  $117^{\circ} 17' E.$  from which deduct  $4^{\circ} 3' 30''$ , the difference of longitude made by the *Britannia* to the shoal, places it in  $113^{\circ} 03' 30'' E.$  by this method. But the North Natuna was also seen by the *Britannia*, subsequent to the Louisa Shoal, and said to be in longitude  $108^{\circ} 40' E.$  (which is too much to the eastward); and probably she may have placed the shoal at its relative distance from the North Natuna, by allowing this island in the lon-

gitude just mentioned. Allowing to this longitude of North Natuna  $5^{\circ} 12' \text{ E.}$  measured by the Angelica to the Louisa Shoal, would place it in  $113^{\circ} 52' \text{ E.}$  which is too much easterly. The position of this shoal, in longitude, may be nearly approximated as follows :

The Angelica, by chronometer, measured  $8^{\circ} 44' \text{ E.}$  from Pedro Branco to the shoal ; allowing this rock in  $104^{\circ} 25' \text{ E.}$  will make the Louisa Shoal in  $113^{\circ} 09' \text{ E.}$  and this ship made by chronometer  $3^{\circ} 32' \text{ E.}$  from Pedro Branco to North Natuna, places the latter in longitude  $107^{\circ} 57' \text{ E.}$  by this means.

Captain Wilson, by chronometer, made  $6^{\circ} 00' \text{ E.}$  from Malacca to east point of North Natuna ; allowing Malacca in  $102^{\circ} 14'$  gives North Natuna in longitude  $108^{\circ} 14' \text{ E.}$  add  $5^{\circ} 12'$  difference of longitude, from North Natuna, made by Angelica to Louisa Shoal, places it in  $113^{\circ} 26' \text{ E.}$  by this means. Mr. Robertson's longitude of North Natuna is  $107^{\circ} 52' \text{ E.}$  add  $5^{\circ} 12'$ , places the shoal in longitude  $113^{\circ} 04' \text{ E.}$  by this method. In 1804 Captain P. C. Macfarlane, by good chronometer, made  $2^{\circ} 34' \text{ E.}$  from Pulo Domar to North Natuna, allowing Pulo Domar in  $105^{\circ} 33' \text{ E.}$  makes the North Natuna in longitude  $108^{\circ} 07' \text{ E.}$  add  $5^{\circ} 12'$ , places the Louisa Shoal in longitude  $113^{\circ} 19' \text{ E.}$

By retrograde computation, from chronometer sights, taken on meridian of Grand Ladrone, Captain Macfarlane's chronometer makes Balabak Peak in longitude  $117^{\circ} 05' \text{ E.}$  allowing the Grand Ladrone in  $113^{\circ} 44' \text{ E.}$  The Mangsee Islands are 16 miles east from meridian of this peak, or in longitude  $117^{\circ} 21' \text{ E.}$  by this means ; and the Britannia, by chronometer, made  $4^{\circ} 03' 30'' \text{ W.}$  from the Mangsee Islands to the shoal, which places the Louisa Shoal in longitude  $113^{\circ} 17' 30'' \text{ E.}$  by this approximation.

By the mean of these last five methods, the longitude of the Louisa Shoal is  $113^{\circ} 15' \text{ E.}$  It seems probable, therefore, that the correct position of this shoal is between  $113^{\circ} 15'$  and  $113^{\circ} 20'$  of east longitude.

Captain Dickie made the Louisa Shoal in latitude  $6^{\circ} 24' \text{ N.}$  and longitude  $113^{\circ} 26' \text{ E.}$  in 1804.

#### CORAL SHOALS AND REEFS,

Seen in his Majesty's transport Gloucester, in 1796—" August 1st, at 2 P. M. saw breakers from S. S. E. to S. E. b. S.  $\frac{1}{4}$  E. about four leagues ; shortened sail and hauled our wind to near them ; we then discovered them to be a long reef of rocks,

many of them dry, with a sand-bank extending from S. S. W. to S. W.  $\frac{1}{2}$  S. At midnight light airs, sounded in 23 fathoms, hove to; had 30, 13, 10, and 8 fathoms, saw rocks under the ship, wore and stood various courses to endeavour to get off the shoal; had soundings 30 to 8 fathoms, sometimes shoaling from 20 to 5 fathoms at a cast: at day-light hauled to the north-west, hoisted out the boats and sent them to find a passage. Latitude of this shoal  $7^{\circ} 45' N.$  longitude  $114^{\circ} 50' E.$  by observations of Sun and Moon.

“ August 2d, noon latitude observed  $7^{\circ} 48' N.$  the boats ahead sounding for a passage; steered N. W. b. N. from noon, five miles, then 45 fathoms; steered three miles more on the same course, then no ground 75 fathoms; steered N. W. six miles, no ground; being then 5 P. M. furled courses and top-gallant sails, steered N. E. four miles, and east eight miles, being 8 P. M. found ourselves in 11 fathoms; anchored immediately in  $7\frac{1}{2}$  fathoms, rocky bottom.

“ At 9 A. M. with the wind at south-west, weighed and steered S. E. with a boat ahead sounding; had 9, 12, 17, 18, 17, 15, and 17 fathoms. At noon, in 23 fathoms, latitude observed  $7^{\circ} 55' N.$  longitude  $114^{\circ} 54' E.$  by chronometer, having had little wind from the time of weighing. Steered on S. E. in soundings 27, 7, 6, and  $\frac{1}{4}$  less 5 fathoms on a large rock, deepened again immediately to 7, 8, 10, 20, and 27 fathoms. At 4 P. M. August 3d, no ground 100 fathoms, being then about a mile southward from the spot on which we had a  $\frac{1}{4}$  less 5 fathoms, having steered  $3\frac{1}{2}$  miles S. E. and south one mile from noon to 4 P. M. Experienced light variable winds, and little or no current, since we made these shoals.”

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## SITUATION OF SHOALS ABOVE WATER,

Seen by Captain Shaw, in the American brig *Pennsylvania*, during his passage up the China Sea, in December 1803.

" No. of Shoals or Reefs.	Latitude.	Longitude.	
1	7° 52' N.	113° 30' E.	seen by Ardassier and Cornwallis.
2	7 26	114 48	seen by Ardassier.
3	7 33	114 51	
4	8 17	114 43	
5	8 48	115 17	
6	8 58	115 21	seen by Viper.
7	9 04	115 17	
8	10 00	115 20	
9	9 45	114 49	Fanny lost in 1803.
10	9 32	116 34	
11	9 47	116 58	
12	9 52	116 48	
13	10 23	116 49	
14	10 49	117 10"	

N. B. It is said that the longitudes, of the preceding dangers, are by chronometer.

## CORAL BANKS ON THE NORTH-WEST COAST OF BORNEO.

" Ship *Luconia*, Nov. 6th, 1803, latitude observed 5° 24' N. steered N. E. b. E. 1½ mile, and saw breakers at half past 12, bearing from S. E. ¼ E. to E. S. E. ¼ S. distant about 2½ miles ; at the same time breakers seen from the mast-head bearing N. N. W. our longitude uncertain.

" November 13th, half past 6 A. M. saw the rocks under the bottom ; had 8½ and 9 fathoms coral, Kenney Balloo E. S. E. ¼ S. off shore about five leagues. This shoal, called *Toob Bemanda*, is very correctly laid down in Mr. Dalrymple's Charts, as to the bearings ; but it is evidently of greater extent. From nine fathoms, on this shoal, steered north-easterly 1½ mile ; had 10, 11, 12, 15, 21, 30 fathoms, and no

ground 30 fathoms. Steered N. E. b. E.  $1\frac{1}{2}$  miles; had 10 fathoms next cast, then no ground 20 fathoms. Steered N. E. b. E.  $3\frac{1}{2}$  miles, being then noon, observed in latitude  $6^{\circ} 30' N$ .

“ November 16th, at 9 A. M. saw the rocks under the ship's bottom, had 11 fathoms; steered S. E. to S. E. b. E. three miles, in 11, 10, 8,  $7\frac{1}{2}$ ,  $8\frac{1}{2}$ , 9,  $9\frac{1}{2}$ , 11, 13, and 14 fathoms, then saw Kenney Balloo bearing S. S. E.  $\frac{1}{2}$  E.; steered S. E. three miles, being then 11 A. M. saw the Mantannane Islands bearing E. S. E. 5 or 6 leagues; steered S. E. two miles, then observed in latitude  $6^{\circ} 56' N$ .

“ N. B. The shoals do not extend so far from the Mantannane Islands as laid down in the charts; you may stand with safety within  $1\frac{1}{2}$  miles. The shoal, or rock, laid down 12 miles to the northward of the above islands, does not exist.

“ November 19th, at sun rise, Kenney Balloo S.  $\frac{1}{4}$  E. when we saw rocks under the bottom, had soundings 7, 7, 8, 9, 9, 10, 11, 13, 11, 13, 9, 11, and 15 fathoms, coral and sand: when in 15 fathoms, at 7 A. M. saw Balambangan bearing N.  $76^{\circ}$  E. and Banguey Peak N.  $80^{\circ}$  E. At noon the observed latitude  $7^{\circ} 12' N$ . wind E. N. E. steering S. E. had 9, 9, 7, 6,  $5\frac{1}{2}$ , 6, 7, 8, 10, and 13 fathoms coral rocks; when on this coral shoal, at 1 P. M. having run  $2\frac{1}{2}$  miles from noon, Banguey Peak bore N.  $70^{\circ}$  E. the north point of Borneo E. b. S. 6 or 7 leagues; the rocks plainly seen alongside.”

In latitude  $7^{\circ} 22' N$ . longitude  $113^{\circ} 44' E$ . Captain S. Wedgeborough saw the appearance of a rock or reef above water.

#### BANKS NEAR CAPE ST. JAMES, COAST OF TSIOMPA.

Captain Purefoy says, there is a small bank bearing about south from the Pitch of Cape of St. James, distant 4 or 5 miles, on which he had three fathoms, hard ground.

The ship Page, on July 17th, 1804, weighed from St. James's Bay, and rounded the cape with the subsequent bearings, distance, and soundings.







## ERRATA

### IN THE MEMOIR OF THE NAVIGATION TO AND FROM CHINA.

- Page 7, line 11, *for* on the westward, *read* to the westward.  
7, — 9, from bottom, *for* N. b. E.  $\frac{1}{4}$  N. *read* N. E.  $\frac{1}{4}$  N.  
8, — 3, from top, *for* the, *read* this.  
18, — 8, *for* that, *read* this.  
19, — 12, from bottom, *for* 60° 0' N. *read* 6° 00' N.  
19, — 10, from bottom, *for* Lanwan, *read* Lanawan.  
25, — last line, *read* at a considerable.  
36, — 7, *for* but, *read* end.  
52, — 14, *for* more, *read* most.  
52, — 4 and 5, from bottom, *for* Mangerge, *read* Mangerye.

### APPENDIX.

- 57, — last line, after appears, *read* that the.
- 

### IN THE MEMOIR ON THE NAVIGATION OF BOMBAY HARBOUR.

- Page 3, line 5, from bottom, *read* of a S. b. E. line.  
4, — 13, from top, *for* soundings, *read* sounding.  
8, — 11, from bottom, *for* off, *read* of the middle Ground.  
13, — 6, from top, *for* the, *read* the.  
19, — 6, from top, *for* when you, *read* when you have it.



**MEMOIR**  
**OF A**  
**PLAN,**  
**DEVELOPING**  
**THE NAVIGATION**  
**OF**  
**BOMBAY HARBOUR.**

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**1805.**



# MEMOIR

ON THE

## NAVIGATION OF BOMBAY HARBOUR.

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### I. DESCRIPTION OF THE DANGERS.

**T**ULL Reef, or Foul Ground off Tull, being little known, may be considered as the greatest danger in the entrance of Bombay Harbour, during the south-west monsoon, to ships at a great draught of water.

In Mr. Nicholson's large Plan of Bombay Harbour, and a Plan lately copied from it, but reduced to a smaller scale, Tull Reef is projected in the form of a tongue to the westward, from the point of Tull; the extreme point of it being about  $1\frac{1}{2}$  mile from the point; whereas the outermost part of rocky ground, on which a deep ship will strike at low water, is about  $2\frac{1}{4}$  miles distant from the nearest part of Tull. To elucidate this, it may be observed, that in the Plans alluded to, a S. b. E. line from the Lighthouse is clear to the westward of the extremity of Tull Reef; although in reality, this line passes over to the middle part of the reef, where there is frequently 1 and  $1\frac{1}{2}$  fathoms more water than on the rocky patches, near a mile further out. Instead of S. b. E. line being clear to the westward of the extremity of Tull Reef, a due south line from the Lighthouse just touches the western edge of the outermost patch of rocky ground, on which there is only  $3\frac{1}{2}$  or  $3\frac{3}{4}$  fathoms at low water spring tides, over some of the rocks, with one and two fathoms more water in some of the gaps between them. The Surat Castle beat off her rudder, on one

of the outermost patches of Tull Reef, and narrowly escaped being lost, by the sea driving her over the patch into deep water within it.

The Reef, or Foul Ground off Tull, is composed of rocky bottom in general, but there are large gaps of softish ground between some of the rocky patches; particularly within the outermost patches, there is a gap or small channel of deep water and softish ground extending in a N. N. E. and S. S. W. direction over the reef, which gap is wide in the eastern part.

Into this channel, or gap of soft ground, the Surat Castle drifted after losing her rudder.

In the fair weather season several ships pass through this gap of the reef, within the outermost patches, without knowing it; occasioned by the incorrect delineation of this reef in the former Plans of the Harbour: and, it was not until after several days soundings on the reef, and about it, that the outermost rocky patches were discovered.

The soundings are not a sufficient guide towards the Foul Ground off Tull, especially with the Mount or Nob\* of Tull bearing from E.  $\frac{1}{4}$  N. to E. b. S. at which bearings the rocky patches are most distant from the shore, and the depth of water decreases very little near them. The Lighthouse, on Old Woman's Island, and the Island Kanary, are on the same meridian. By standing no nearer the Foul Ground, than Kanary bearing S.  $\frac{1}{2}$  E. or the Lighthouse N.  $\frac{1}{2}$  E. the outermost patches will be avoided: or keep the Lighthouse a little open to the eastward of all Malabar Hill, until Gull Island† is about half a point open to the southward of the low woody south point of Caranja, near the Great Hill; or until the south brow of Caranja Great Hill bears E. b. N.; you are then to the northward of the extremity of Tull Reef. Gull Island a little open, or just touching the low woody south point of Caranja, when the Lighthouse bears N.  $\frac{1}{2}$  W. or a little shut in with the eastern shoulder of Malabar Hill, you are then on the northern point of the Foul Ground, where  $5\frac{1}{2}$  fathoms is the least water, rocky bottom, at low water spring tides. There is no danger in the fair weather season, by standing a little upon this point of the Foul Ground, as from  $4\frac{1}{2}$  to  $5\frac{1}{2}$  fathoms, hard ground, is the least water at low spring tides: but do not shut Gull Island far in upon the low woody point of Caranja.

Caranja Shoal is an extensive bank, situated on the eastern side of Bombay Harbour, projecting a great way out to the westward from Caranja Island. The south-

\* A small mount near the sea, about a mile eastward from the north-west point of the land of Tull. This mount, being near the sea, and detached from the more distant land, is useful as a mark in thick weather, for avoiding the South-west Prong, &c.

† A large rock in the entrance of Penn River, always above water.

west edge of this shoal bears about N. b. W. from Tull Nob, and about west from the south brow of Caranja Great Hill, distant from Gull Island near two miles to the north-westward.

The north part of this shoal, opposite to the Little Hill, is steep to and rocky in some places; but the south part of it, abreast of the Great Hill, is more even, composed of a hard sandy bottom, and not so steep as it is abreast of the Little Hill. On the southern edge of Caranja Shoal, abreast the Great Hill, in fine weather, being certain of not missing stays, a ship may borrow to have a hard or shoal cast in working, but should tack on having the first cast of hard soundings, particularly in a large ship, and near low water.

South-west Prong (generally called) or south-west extremity of the reef, which surrounds Old Woman's Island, forms the northern boundary of the entrance into the harbour, and Tull Reef the southern limit. In a description of Bombay Harbour, the extreme point of the South-west Prong is said to bear S.  $40^{\circ}$  W. from the Lighthouse: but it bears S.  $36^{\circ}$  W. distant 2.9 miles, or near 3 miles. From the incorrect delineation of Tull Reef, in the former Plans of the Harbour, and the error of  $4^{\circ}$  in the bearing of the pitch of the South-west Prong from the Lighthouse; the entrance into the harbour, between the Prong and Tull Reef (of soft ground), is represented wider than it really is; which is an error liable to endanger ships, especially in the south-west monsoon, if unacquainted. From the projecting point of the south-west Prong, a N.  $36^{\circ}$  E. line passes through the Lighthouse, and through Broughton's Grove, on Old Woman's Island, and through the Flagstaff of the Castle; then touching the inner part of Cross Island, passes to the central part of the Neat's Tongue on Salset Island, making a transit line with all these places. The South-west Prong consists of sharp rocks: the soundings are no guide in standing towards it, being steep to on all sides. At low water springs, the rocks are seen above water at a considerable distance from the Lighthouse, in the direction of this Prong; and when the sea runs high in the south-west monsoon, it occasions high breakers far out upon the Prong at low water, but not to its extreme point. When the Funnel Hill\* can be seen, which only happens in clear weather, it is a good mark for entering the harbour: keep it just open with the north brow of Caranja Great Hill, or that part of the hill E.  $7^{\circ}$  N. until the Oyster Rock is brought on with the Flagstaff of Bombay Castle; you may then begin to haul to the north-eastward round the reef; but, by the time the Lighthouse is brought to bear to the westward

\* A remarkable hill, with a rock resembling a chimney on it; it is 18 miles eastward from Bombay Castle.



of north, or N.  $\frac{1}{2}$  W. draw the Oyster Rock as far in upon the town as the Courthouse; (which is the largest building); and the Lighthouse brought N. N. W. the Oyster Rock ought to be brought on with the Church Steeple: and you should continue then to steer over to the eastward, to pass well clear of the Sunken Rock \* Shoal, by bringing Mazagon House, or Hill, a large half point open to the eastward of the north-east (or outer) Bastion of Bombay Castle. Keeping on this mark will carry a ship clear to the eastward of the Sunken Rock Shoal (or Reef), to the eastward of the Dolphin Reef, and to the westward of the Middle Ground, amongst the shipping in the harbour.

On the high land of Tull, about S. E. b. E. from the Nob, there are two small elevated spots near each other (but not very conspicuous) called the Paps; they are situated on the northern declivity of the high land. When the Funnel Hill is not visible, Tull Nob on with the northernmost of the two Paps, is a safe but close mark, in passing the extreme point of the South-west Prong. Do not bring the Nob of Tull to the southward of this North Pap, in passing the extremity of the Prong; for the Nob between the Paps will carry a ship on the extreme point of the Prong, where a large ship may strike on the rocks at low water, if there is any swell.

When the Lighthouse bears N. N. E. there is a bason, or gap, in the reef surrounding Old Woman's Island; the bottom in it is soft, and the same depth of water as in the channel. This gap separates the outer part of the reef, or South-west Prong, from the eastern part generally called the South-east Prong, which commences when the Lighthouse bears about N. b. E.  $\frac{1}{2}$  E. extending in nearly a north-east direction to the Sunken Rock Shoal. This part of the reef is also composed of rocky bottom, and has some small gaps of soft ground and deep water on its outer edge, when the Lighthouse bears from N. b. E. to N.  $\frac{1}{2}$  W.: there are several small holes, or places of soft ground and deep water, well in upon the reef, with  $3\frac{1}{2}$  or 4 fathoms rocky bottom far without them, towards the southern verge of this part of the reef.

The soundings towards the eastern part of the reef, like those close to the South-west Prong, are steep, with soft muddy bottom: and from the outer edges of these reefs, across the entrance of the harbour, to the edge of Tull Reef, the depth of water differs very little; there being within half a fathom of the same depth, close to the edges of the reefs, in most places, as there is in mid-channel; but rather

\* A buoy is generally placed near, or upon it, and a pilot vessel stationed at it in the south-west monsoon.

less near the edge of the Foul Ground off Tull, than towards the Reef of Old Woman's Island.

When so far entered the harbour, as to have the Lighthouse N.  $\frac{3}{4}$  W. or N. b. W. the eastern part of the reef extending from Old Woman's Island, is not so steep and dangerous as it is further out; for the hard rocky bottom in this part is more even; and, in exigent cases, ships not drawing much water, may venture to get a hard cast on the edge of the reef, when the Lighthouse is more westerly than N.  $\frac{1}{2}$  W. and more than half flood at the time: but if near low water, and any swell prevails, it will not be safe to stand on any part of the reef, particularly if a ship draws much water; for speaking generally, it is uneven rocky bottom, and steep to on the outer edges.

Mr. Nicholson's mark for passing clear without the South-east Prong (or eastern part of the reef), viz. the Flagstaff of Bombay Castle open to the eastward of the Oyster Rock, is too close: for keeping on this mark, in running along the edge of the reef, a deep ship may strike at low water spring tides, with the Lighthouse N. b. W. to N. W. if there is much swell. It may be observed, that the Oyster Rock is situated near Old Woman's Island; and a small part of it only visible above water at high spring tides, prevents it from being easily discerned; consequently it is a mark not sufficiently conspicuous, until well up the harbour.

Sunken Rock Shoal is near half a mile in length, east and west, and near two cables lengths in breadth, at the widest part: it consists of uneven hard ground, 2 and 3 fathoms at low water, springs. On the outer edge to the eastward, there is a large rock on which the sea sometimes breaks, when near low water, in the south-west monsoon; but this is seldom the case, there being  $1\frac{1}{4}$  and  $1\frac{1}{2}$  fathoms over the rock, at low water spring tides. From this rock, the shoal is called generally the Sunken Rock. The buoy (when there is one) is mostly placed at a small distance without this outer rock, and bears from the Lighthouse S.  $68^{\circ}$  E. 1.39 miles.

Near half a mile from the outer rock, there is on the inner part of this shoal, another rocky place with  $1\frac{1}{2}$  and 2 fathoms at low water; and from 2 to 3 and  $3\frac{1}{2}$  fathoms are the depths on the middle of the shoal between the outer and inner rock.

The north-east part of the reef, surrounding Old Woman's Island, joins to the inner part of the Sunken Rock Shoal, and makes the passage inside of the latter unsafe, except for very small vessels.

The northernmost tomb on Old Woman's Island, in one with the south part of the Oyster Rock, is clear to the northward, or above the Sunken Rock Shoal.

Malabar Point, or Flagstaff, open to the southward of the southernmost grove of trees on Old Woman's Island, is clear to the southward of the Sunken Rock Shoal.

Dolphin Reef is a rocky shoal north-north-eastward from the Oyster Rock, projecting out to the eastward from Boughton's Grove, which is a large grove of cocoa-nut (or brab trees) on the north-east part of Old Woman's Island. On the inner part of the Dolphin Reef, near the shore, the rocks are dry at low water, springs.

Mazagon House, a little open with the north-east Bastion of Bombay Castle, is on the outer edge of the Dolphin Reef; but half a point open with the Bastion, is clear to the eastward of this reef. When Malabar Point is on with the gut between Old Woman's Island, and the south point of Bombay (or sandy point called Mendam's Point), you are clear to the northward of the Dolphin Reef. And Malabar Point, a little to the southward from the south end of Broughton's Grove, is clear to the southward of this reef.

Apollo Spit is hard and stony, but not dangerous. Ships moor clear of it, to prevent grounding or rubbing their cables: it extends out from the saluting battery, to a considerable distance. When on the outer point of it, the Guardhouse over the Apollo Gate is between the small turret and the bushy tree on the ramparts; and Mazagon House a little open with the north-east Bastion of Bombay Castle.

Middle Ground Shoal is steep on every side. On the south-east side it is a steep wall of rocks, and the water nearly breaks on it when blowing hard, at low water spring tides, there being only 3 and 4 feet water on the shoalest places, at these times. Suree Fort, just touching the west point of Cross Island \*, is clear inside, or to the westward off the Middle Ground.

The oblong woody hill (close to the northward of Parell Hill), a little more than half shut in with the west end of Cross Island, is clear to the eastward, or outside of the Middle Ground: or the sandy beach to the left (or southward) of Suree Fort, all open outside, or to the eastward of Cross Island, is clear without, or to the eastward of the Middle Ground.

The church steeple and Bunder Gate in one, is clear of the upper end, or to the northward of the Middle Ground.

Malabar Flagstaff, or Point, on with the south sandy point of Bombay Island, is clear to the southward, or below the Middle Ground.

Flagstaff Shoal consists of rocky bottom; the depth of water is about 14 feet

\* A small round island about two miles to the northward of the shipping in the harbour.

on the shoalest parts of it at low water spring tides. The ships in the harbour moor, between this shoal, the Middle Ground, and Apollo Spit, abreast of the town.

The church steeple and Flagstaff in one, and Mazagon Ruined Fort (or black tower) on with the gap between Parell Hill and the Oblong Woody Hill, is on the centre of the Flagstaff Shoal. Mazagon Fort, on the centre (or rather nearer the gap than the centre) of the Oblong Woody Hill, is clear inside of the Flagstaff Shoal.

Mazagon Fort, on the centre of Parell Hill, is clear outside, or to the eastward of the Flagstaff Shoal.

The church steeple, a little open to the southward of the Single Brab Tree on Castle, is clear to the northward, or above the Flagstaff Shoal.

The Flagstaff on Castle, a little more than half way from the steeple, towards the Single Brab Tree on Castle, is clear to the southward, or below the Flagstaff Shoal.



## II. DESCRIPTION OF THE HILLS AND LAND.

OLD Woman's Island is low, with a small mount on the south part, a little higher than the other parts; on this the Lighthouse is situated, which is white-washed; and the Lantern being 130 feet above the level of the sea, may be perceived at a considerable distance in clear weather, but this is not often the case about the entrance of Bombay Harbour.

The north part of this island, on which Broughton's Grove is situated, is at high water spring tides separated from the southern part of the island, by a small causeway, over which the sea flows. Recently, the southern division has been denominated Colabah, and the smallest part, to the northward of the Tombs, Old Woman's Island.

Bombay Island appears very low, coming from seaward, except Malabar Hill, of middling height, which has a regular oblong aspect, sloping a little towards the sea, and is covered with trees, having a few white houses among them, and a house and flagstaff at the point.

Mazagon Hill is of middling height, rather low, and not easily known until well

up the harbour. Parell is a roundish mount with a flagstaff on it; but it and the woody oblong hill near it, are not perceived until far up into the harbour. Suree Fort is on a point of land near these hills.

Neat's Tongue is an oblong high hill on the Island Saliset: in clear weather this hill is conspicuous, and seen to a considerable distance at sea. It has a regular outline, its name being descriptive of its appearance. On the south-east point of the Neat's Tongue is a white house, which answers as a mark to keep clear of Caranja Shoal, by keeping it, or that point of the Neat's Tongue, a little open with the north-west end of Butcher's Island. This is a low island, situated far up the harbour, between Caranja and Salset: it is of a regular level appearance, with a few trees on it, and some small buildings; but it is not seen until entered the harbour. Towards the south end of Caranja Shoal, abreast the Great Hill, the south-east end of the Neat's Tongue may be brought to touch the north-west end of Butcher's Island.

Elephanta is about 3 miles south-eastward from the point of the Neat's Tongue: it is about the same distance east from Butcher's Island, with the summit (or peak) a little northward from its centre. In approaching the harbour from the south-west, or westward, Elephanta Island is the first insulated piece of high land seen to the right of the Neat's Tongue.

Caranja Island is to the southward of Elephanta, on the east side of the harbour; being low and woody, except two remarkable hills, which are large and conspicuous, with a neck of low land between them.

Caranja Little Hill is situated on the north part of the island, has an uneven outline, appears about equal in height to Elephanta, and resembles it when seen at a distance. It is the second insulated piece of high land seen to the right of the Neat's Tongue.

Caranja Great Hill, situated near the south part of Caranja Island, is a very remarkable piece of high land; being level on the top, somewhat like a table, with a little convexity; and at each end the declivity steep, which parts are called the north and south brows of the hill. There is on the north brow a small knob, with the ruins of a building; which is not perceived, except near it. The Great Hill is the third piece of high land, to the right from the Neat's Tongue; which appears insulated, in coming from the westward: and the high land of Tull, the next in succession, to the right (or southward); the opening between these leads into Penn River.

The Island Henry is low and fortified all round with a wall; situated about a mile from the shore; and bearing about E. b. N. distant  $1\frac{1}{2}$  miles from Kanary.

Kanary Island and the Lighthouse, on Old Woman's Island, are on the same me-

ridian; distant  $00^{\circ} 11' 33''$  from each other: the former being in latitude  $18^{\circ} 42' 12''$  N. and the latter in  $18^{\circ} 53' 45''$  N. Kanary is a small island, covered with houses and trees, encircled by a fortified wall; it appears of an oblong square form, level and small when viewed at a distance; and is just discernible at 15 miles distance, from the deck of a large ship, in clear weather; when seen clear of the land.

North-east Bastion of Bombay Castle, is the projecting corner of the works towards the sea: in coming up the harbour, abreast of the sunken rock shoal, this bastion is not easily distinguished from the wall of Fort George, which is situated a little further to the northward; and its site higher than the bastion of Bombay Castle.

The Flagstaff, situated on the south-east bastion of Bombay Castle, is in north latitude  $18^{\circ} 55' 48''$ ; and by mean of 10 immersions and 6 emersions of the 1st and 2d Satellites of Jupiter, in longitude  $72^{\circ} 57' 40''$  E. from Greenwich. Taken in January, February, March, and April, 1803, and compared with M. De Lambre's computation for Greenwich, mean time.

April, 1803. By means of azimuths and amplitudes, taken at base of Lighthouse on Old Woman's Island, variation  $00^{\circ} 50''$  W.; and has altered little during these twenty years.

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### III. OF TIDES AND SOUNDINGS.

It is particularly requisite for every person navigating in, or about the entrance of Bombay Harbour, to keep in remembrance the rise and fall of the tides; which is from 14 to 16 feet near the full and change of moon, and 10 or 12 feet perpendicular, at the quadratures. It is therefore proper to observe; that, at low water spring tides, the depth close to the south-west prong, and round the edge of the reef extending from Old Woman's Island, is  $6\frac{1}{2}$  to 7 fathoms, and 9 or  $9\frac{1}{2}$  fathoms at high water. The depth of water close to the north-west extremity of Tull Reef, is generally about half a fathom less than is experienced near the prongs: and in mid-channel, between them, about half a fathom more than is found towards the prongs.

The Light-house, bearing North or N. b. W.; the depth at low water spring tides, is about  $7\frac{1}{4}$  or  $7\frac{1}{2}$  fathoms, in the fair channel between the Reefs; and shoals gradually

in proceeding up the harbour ; about  $6\frac{1}{4}$  and  $6\frac{1}{2}$  abreast the Sunken Rock Shoal, and 5 to  $5\frac{1}{2}$  fathoms around the Middle Ground Shoal. But in the entrance, and also within the harbour, marks (and not soundings) must be the principal guide.

Except upon the reefs or shoals, the bottom is soft mud or clay throughout the harbour, affording good anchorage.

The velocity of strong spring tides, between Tull Reef and the Prongs, is  $2\frac{1}{2}$  or  $2\frac{3}{4}$  miles per hour ; and nearly the same further up the harbour, without the shipping : where they moor, it is not so strong.

In the entrance of the harbour, between the extremity of the South-west Prong and Tull Point, the tide does not set fair up and down the channel ; but the flood takes an easterly direction, slanting over the projecting part of Tull Foul Ground, towards the opening into Penn River, between Tull Point and Caranja Island. And the ebb tide, during the rains in the south-west monsoon, from Penn River, sets strong to the westward between the Foul Ground off Tull and the South-west Prong ; which greatly assists ships when working out, in this monsoon. But it is only in spring tides that the freshes set strong out of Penn River to the westward.

It is high water in the harbour at the Dock Head, and where the ships moor, at a few minutes past 11 o'clock, Full and Change of Moon : and about three quarters of an hour later, below the Sunken Rock Shoal, in the entrance of the harbour.

Back Bay is a deep bay formed by Malabar Hill to the northward, and Old Woman's Island to the southward, which, to persons unacquainted, in thick weather, may appear as the entrance of the harbour, if the Lighthouse is not perceived, nor Malabar Hill known by its appearance ; or other land-marks not visible.

The breadth of Back Bay, from Malabar Point to the Lighthouse, is near three miles ; and from this point, the extreme point of the South-west Prong bears S.  $\frac{1}{4}$  W. distant five miles. From Malabar Point to the Lighthouse, across Back Bay, the water is very shoal, with reefs of rocks partly dry at low water. In this bay there is a small channel for boats, close along Malabar Point and Hill.

The depth of water, west from Kanary, is seven fathoms at low water, when it is about five miles distant ; 14 fathoms 10 miles off, 30 fathoms about 20 miles west from it, about 40 fathoms when 11 leagues distant ; and the depth is only increased to 50 fathoms at two degrees distance west from this island, so flat is the bank on the parallel of Bombay Harbour.

It has been already noticed, that towards the verge of the South-west Prong, the soundings are no guide, it being steep to ; but to the northward of the Prong, when

the Peak of Elephanta is shut in with the Lighthouse, the depth decreases gradually on the edge of the hard ground, which projects from the rocky ledges of Back Bay, to seaward.

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#### IV. REMARKS RELATIVE TO APPROACHING BOMBAY HARBOUR IN THE SOUTH-WEST MONSOON.

THE soundings extending a great way to the westward, from this part of the coast, will always denote the approach towards the land, if the longitude is not correctly known. The chart of this part of the coast, by Lieut. McCluer, may be useful in running in, by exhibiting the soundings on the bank south-westward from Kanary, if it is thought proper to get soundings upon it.

During the latter part of May, June, July, and August, ships should endeavour to make the Island Kanary: for it is dangerous to fall in with the land, to the northward of the entrance into the harbour, in these months, it being very difficult to work to the southward, round the South-west Prong; especially when blowing hard from W. S. W. or S. W. which winds prevail in May, June, and July: at times also in August. But a ship should not run in with the land, to the southward of Kanary, as there might be difficulty in weathering that island; should the wind incline to blow in squalls from the westward, or W. N. W. which is sometimes the case in June, although more to be expected in July and August. It is therefore most proper to make Kanary, bearing from E. to S. E. according as the direction of the wind is experienced, on nearing the land, to borrow a little either way, so as to obtain a fair wind to enter the harbour.

By getting to the northward of the South-west Prong in June, some ships have drove on the shore; one near Versavah, where most of the crew perished, and the ship dashed in pieces: others have been in distress, and with great exertions got around the Prong, into the harbour.

In April and May, gales of wind have been known at Bombay; but no gale has happened here in April, during the preceding 22 years: and a few which have prevailed in May, during the same period, have been of short continuance, and not



severe, although on the coast to the southward, some of the gales in May have done considerable damage.

The commencement of stormy weather, concordant with the south-west monsoon, generally accompanies the spring tides about the change of the Moon ; from the 4th to the 15th of June. From the 8th of June to the middle of July, the chance of cloudy weather, hard squalls, and much rain, may be frequently apprehended.

It has been observed at Bombay, that the blowing weather of the south-west monsoon seldom commences with the Full Moon springs, but generally in the dark nights. About Anjenga and Cape Comorin, the south-west monsoon commences much earlier than at Bombay, proceeding regularly to the northward : and on the southern part of the Malabar coast, the blowing weather abates proportionally sooner than at Bombay. On the coast of Guzarat, to the northward of the high land of St. John's, about Surat, the Gulphs of Cambay and Cutch, the southerly winds set in also much sooner than at Bombay.

A ship running for Bombay Harbour, from the middle of May to the middle of July, or later, may have fresh steady gales and clear weather, until within 20 or 25 leagues of the land. When so near it, in June and July, dark weather and rain may often prevail, precluding observations. On this account, and to be prepared for hauling off shore, or lying to, if requisite, in these months a ship ought to make snug, and have good courses and topsails bent, that she may be able to keep at a reasonable distance from the shore, in case dark blowing weather prevents the latitude from being correctly known : or in case of not exactly falling into the entrance of the harbour, that she may be enabled to carry proper sail, to reach it expeditiously. When it blows hard in dark cloudy weather, a ship ought not to run for the harbour, unless being pretty confident of the latitude.

In May and June, when southerly winds prevail off the harbour, the current then mostly sets to the northward. And when the freshes, produced by the rains, are strong from the rivers, in July and August, the current frequently off the harbour sets to the southward ; especially when a few degrees southward from Bombay, on the coast, it always sets in this direction, in July, August, September, and October.

## V. BRIEF REMARKS FOR ENTERING THE HARBOUR.

To persons unacquainted, it may be tedious referring to the marks for entering the harbour, and avoiding the dangers, which are explained in Section 1, particularly under the articles Tull Reef and South-west Prong. Therefore the following brief remarks, may be more easily comprehended and attended to, by such persons; and enable them to run into the harbour in the night, in case of splitting sails; or otherwise finding it difficult to keep clear outside of the reefs, when working outward, in the south-west monsoon.

In working out of Bombay Harbour, in blowing weather, while the Lighthouse, or light is seen, a ship should work with it bearing from N.  $\frac{1}{2}$  E. to N. N. E.  $\frac{1}{4}$  E. by which means, the entrance of the harbour from the South-west Prong to Tull Reef, will be retained open, into which the swell will drive her, if there is little wind between the squalls, and prevent her being drifted to the northward of the harbour; or enable her to run in, if any accident renders it indispensable.

Being off the entrance of Bombay Harbour in the night, and obliged from bad weather to run into the harbour, in the south-west monsoon, when the wind is fair for that purpose; if the Island Kanary is seen, and not the light on Old Woman's Island, do not bring it to the southward of S. b. E. or at most S.  $\frac{1}{2}$  E. until the light is seen, to keep clear of the Foul Ground off Tull: particularly if the wind is westward, do not bring Kanary more southerly than S. b. E.; or in shoaling, haul to the northward, or north-north-westward, there being a shoal flat surrounding Kanary, and extending from it to the south-west part of the Foul Ground off Tull. In standing towards this flat, the depth decreases gradually, and increases in standing from it to the north-north-westward, towards the South-west Prong. As soon as the light on Old Woman's Island is seen, let it be the principal guide: bring it to bear about N. b. E. or N. b. E.  $\frac{1}{2}$  E. and run in with these bearings, which will carry a ship fairly into the entrance of the harbour, about mid-channel, between the extremity of the South-west Prong, and the edge of the reef off Tull. If the night is not very dark, Caranja Great Hill will be visible when thus far advanced, and known by its bold and even appearance, and the direction of its bearing. When the south brow of this hill bears E. b. N.  $\frac{1}{2}$  N. it is in one with the north point of Tull Foul Ground, over where the least water is  $5\frac{1}{2}$  fathoms at low water with this bearing, in standing towards Caranja Great Hill. When the south brow of this hill

bears E. b. N. and the light as before mentioned, you are then well clear to the northward, or above the extremity of Tull Foul Ground, and may edge over to the eastward, to give a good birth to the southern part of the reef off Old Woman's Island.

If the night is dark and Caranja Great Hill not discerned, when running in with the light N. b. E. to N. b. E.  $\frac{1}{2}$  E. it may then be difficult to know when you are to the northward of Tull Foul Ground, and approaching the southern edges of the Prongs: in this case it must depend on judgment. The northern part of the Foul Ground off Tull, is upwards of five miles distance from the Lighthouse, where there is any danger on it; whereas the Lighthouse N. b. E. or N. b. E.  $\frac{1}{2}$  E. the outer edges of the Prongs on these bearings, are only about 2 or  $2\frac{1}{4}$  miles distant from it; by which, the light may sometimes be useful as a guide, to judge from what side of the harbour entrance it is seen, by attending to its size and brilliancy.

The south brow of Caranja Great Hill, E.  $\frac{1}{4}$  S. is in one with the edge of the Prongs, when the Lighthouse bears N. b. E.  $\frac{1}{2}$  E. and N.  $36^{\circ}$  E. Therefore the south brow of Caranja Great Hill from east, when near the Prongs, to E. b. N.  $\frac{1}{2}$  N. on the north extreme of Tull Foul Ground, are the bearing for the breadth of the harbour's entrance, between these reefs, which form it.

If Caranja Great Hill is not discerned, in running in with the light N. b. E. to N. b. E.  $\frac{1}{2}$  E. under easy sail; when it is apprehended that a ship is to the northward of Tull Reef, and approaching near the south part of the Prongs, by the appearance of the light or otherwise, she ought immediately to steer well to the eastward, until the light is brought to bear N. b. W. or N. N. W. which is clear above the Prongs, and steep edges of this reef.

Should a ship be deceived in estimating the distance from the light, and have a hard cast on the southern edge of the reef, with the light N. b. E. or N. b. E.  $\frac{1}{2}$  E. she ought instantly to haul south-east, or southward, there being deep gaps in it; and it is steep from  $6\frac{1}{2}$  fathoms soft, to  $3\frac{1}{4}$  or 4 fathoms rocky ground, at low water spring tides; with these bearings of the lighthouse.

On the other hand, should a ship have edged too soon over the eastward, before being clear to the northward of Tull Reef, and have a hard cast or irregular soundings on it, she ought to haul to the north-westward a little, till in the fair channel.

Having run into the entrance of the harbour, with the light bearing N. b. E. or N. b. E.  $\frac{1}{2}$  E. as described, and afterwards edged over to the eastward, until the light is bearing N. b. W. or N. N. W.: being then fairly entered the harbour, above the Foul Ground (or Reef) off Tull, and steep gaps of the Prongs, you may then

steer N. E. or N. E. b. E. until the light is brought to bear W. N. W. When it bears from W. N. W. to W. b. N. you are abreast the Sunken Rock Shoal, and should then edge well over to the eastward, towards Caranja Shoal, to give the Sunken Rock a wide birth. When the light bears W. b. N. you are above the Sunken Rock Shoal; haul directly to the westward, and anchor with the light any way between W. b. N. and W. S. W. which are fair bearings between the Sunken Rock Shoal and Middle Ground Shoal. If the night is dark, to avoid running too close in, towards the Oyster Rock, anchor with the light bearing from W. b. N. to W. b. S.

In edging to the eastward, to give a wide birth to the Sunken Rock Shoal, should a ship get so far over as to have a hard or shoal cast on the edge of Caranja Shoal, there is no danger, if she hauls directly to the westward into the fair channel, and regain the western side of the harbour, as it is not so steep here as to the northward, abreast of the Little Hill of Caranja, and town of Bombay. If the wind is at W. or W. b. N. it will not be prudent to make free with the eastern side of the harbour, either towards Tull Reef or Caranja Shoal.

Previous to concluding these brief remarks, it is proper to observe, that should the wind be fresh, and to the southward of W. S. W. the light from N. b. E. to N. b. E.  $\frac{1}{2}$  E. is a fair and desirable position to run with into the entrance of the harbour, until past the westernmost patches of Tull Reef. But with the wind from the westward, or light and baffling, with a heavy swell setting to the eastward upon Tull Reef, it will be prudent to run in with the light bearing N. N. E. to N. N. E.  $\frac{1}{2}$  E. until approaching near the South-west Prong; then edging away to the eastward, as before directed. The Lighthouse N. N. E.  $\frac{1}{4}$  E. carries a ship within the extremity of the South-west Prong (being on with each other N.  $36^{\circ}$  E.); and the Lighthouse bearing N. N. E. is in a line with the deepest gap in the reef, or bason, between the Prongs.

Further it may be observed, that in all these remarks, when the bearing of the light is mentioned, it is the light of the Lighthouse, on the extremity of Old Woman's Island, that is meant, and not casual lights of the military cantonments on the island.

## VI. TO ENTER THE HARBOUR IN THE NIGHT, WITH A TURNING WIND, WHEN CLEAR WEATHER.

**DURING** the north-east monsoon, when the weather is frequently clear in the night, to save time, persons a little acquainted with the land about the harbour, may work into it with the land wind and flood tide, should Kanary or the light be seen in the evening, or in the night, by observing the subsequent remarks.

When the light on Old Woman's Island is seen, work towards it, traversing with it bearing from N.  $\frac{1}{2}$  E. to N. N. E.  $\frac{1}{2}$  E. until the south brow of Caranja Great Hill is E. b. N. or E. b. N.  $\frac{1}{4}$  N. being then above the extreme point of Tull Reef; long tacks over to the eastward may be made with safety, towards the south end of Caranja Shoal. When the south brow of Caranja Great Hill bears east, you are on the parallel close to the outer edges of the Prongs; and, in tacking from the north side of the channel, ought to keep the light westward of north.

When the light bears from N. b. W. to N. W. the edge of the reef is more regular, and not so steep, as it is further out amongst the Prongs, and close to the gaps in it: for with these bearings of the light, a ship, if not going fast through the water, may stand towards the edge of the reef, so close as to have a hard cast on it, when more than half flood, and the ship not drawing above 18 or 19 feet water. Otherwise, this is not advisable, as some ships have, by borrowing too close in the day time, struck on this part of the reef, when near low water.

Working up the harbour, when the light bears from W. N. W. to W. b. N. the Sunken Rock Shoal is abreast; give it a wide birth, by working well over to the eastward; and in so doing, should the depths of water decrease, or you have a hard cast on the edge of Caranja Shoal, haul directly to the westward, or tack immediately to regain the fair channel.

When the light is bearing W. b. N. you are above the Sunken Rock Shoal; stand then well over to the western side of the harbour, and anchor with the light from W. b. N. to W. S. W. at discretion, between the Sunken Rock and Middle Ground Shoals.

When the night is very clear, the shipping in the harbour will be seen from abreast the Sunken Rock Shoal, if then not too far over to the eastward. Should the shipping be distinctly perceived, and anxious to reach them, when you near the Middle Ground Shoal, or bring the light to bear W. S. W. make certain of not getting too

near the Dolphin Reef on one side, or the Middle Ground Shoal on the other ; the distance between them being only about half a mile. To effect this, Cross Island, if perceived, is the best guide ; keep it bearing from N. b. E.  $\frac{1}{4}$  E. to N. b. E.  $\frac{1}{2}$  E. in passing between the Dolphin Reef and Middle Ground Shoal, amongst the shipping. Cross Island N. b. E.  $\frac{1}{4}$  E. is the best bearing : with it bearing N. b. E. you are close to the inner edge of the Middle Ground Shoal, and when you N. b. E.  $\frac{1}{4}$  E. are close to the outer edge of the Dolphin Reef ; these angular bearings of Cross Island, embracing the breadth of, the channel, when near the shipping.

The outer part of the shipping N. b. E.  $\frac{1}{4}$  E. or on with Cross Island, is also a good mark for passing up with, between the Dolphin Reef and Middle Ground Shoal, to the ships in the harbour : but this mark is only safe, if all the ships are lying inside of the Middle Ground Shoal, which is not always the case ; for when the harbour is crowded, some large ships are moored at times in the stream of the shoal, above it.









